OYU TOLGOI PROJECT SOCIO-ECONOMIC IMPACT ASSESSMENT

FINAL REPORT

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REPORT SUMMARY

Ivanhoe Mines is planning to develop and operate a copper and gold mine in the area of Oyu Tolgoi in the southern part of the Umnugovi aimag. The magnitude of the project as it has been reported suggests that it will have important impacts on the economy and the fiscal position of the Mongolian government\(^1\). In addition to the national level impacts, it will affect local social and economic development, businesses, environment and livelihoods in a variety of ways. Both the size and duration of the proposed project, which is anticipated to operate until 2043, mean that its impacts, both positive and negative, may be considerable. Thus, IMMI initiated a project to look at impacts which the OT project may potentially generate.

The potential impacts described in this report are determined through well-sequenced and planned steps: identification of gaps in the OT socio-economic and environmental baseline report, enhanced field surveys in the OT project area, discussion workshops with experts and consultation workshops with local communities followed by detailed analysis and assessment. Thus, it can be assured that the process by which the impacts and other consequences are identified, both positive and negative include inputs by not only professional study. They are also the result of the contributions of professional experts and local communities.

This report contains results of assessment of various direct and indirect impacts from OT mine actions in particular and also cumulative impacts that take into account other projects and activities in the area. A careful assessment of the potential impacts in this report makes it possible to determine the underlying characteristics of such impacts along with the approximate duration and likelihood of occurrence.

The impacts of the OT project on local development will be mostly positive. These impacts may occur in all spheres of local economic and business development. However, local governments will need to act transparently and in a consultative way with the contributors and resident communities to maximize these positive impacts. It was found that the expectations amongst local communities to supply the mines with agricultural products and other services remain high and need to be managed in an efficient manner. This means that the OT Project’s local purchase policy will be important for local business development, progress and prosperity. A fair and equitable policy, especially with incentives and assistance to local businesses, will have a major positive effect in the local economy. Expectations of local communities to share mine infrastructure are high.

Population migration into mining areas is an issue of concern. The OT Project may result in the in-migration of direct and indirect employees (and their families) from elsewhere in the country and overseas, which would contribute to population growth, particularly to working age population growth. Both OT Project and the Governors of the soums need to engage with the Local Development Plan to ensure that the integrated community development plans are adjusted to provide for this influx of population. Other authorities in the area such as the police services, health services, and education sector must also be consulted on the issue.

\(^1\) The Economic and Fiscal Impacts of the Oyu Tolgoi Project on Mongolia: Phase 2. Prepared for Ivanhoe Mines by Ernie Stokes, The Centre for Spatial Economics Toronto, Canada, September 2005
The OT Project will create direct and indirect sex-selective employment. Thus, the sex ratio of population in the Project impact area will tend to gradually grow, as a result of increased employment favorable to men. Impacts on the gender balance can be mitigated by introducing encouragement of female workers through an OT Employment Action Plan.

Direct or indirect male employment, which is created by the OT Project, may have negative consequences on the wellbeing of married people as well as on their children. Workers may suffer loneliness and anxiety over their families back home, and a cold reception from family members, who have been estranged from them over long periods, when they return. A “family-friendly” Employment Action Plan could be implemented to mitigate these impacts. This plan may well include issues on recruitment of family members, and work-life balance.

Employment is an area where direct, positive impacts of the Project can be observed. The impacts associated with employment will result from all phases of Project activity with a peak during the construction and operation phases in particular. The benefits of project-generated employment include (i) increased employment for locals, (ii) increase in household income, iii) indirect employment, and (iv) skills development for locals. Besides these direct and positive impacts, there might be some indirect and negative concerns, which are: (i) disaffection among locals at outsiders taking jobs, ii) conflicts between locals and outsiders, and iii) the gender impact on labor force participation.

The OT Employment Action Plan needs to focus on maximizing employment-related benefits through managing potential concerns. IMMI plans to maximize Mongolian employment levels (targeting a 90% national workforce by the fifth year of operation). Mongolian exposure to the specific technical and trade skills required for the project has been limited and an extensive training program will be required to achieve the above level of local participation. Skills development training programs are likely to play an important role in the successful implementation of the Employment Action Plan.

Due to increased population growth, population density and the in-migration process, increased pressure on services and a reduction in the accessibility and range of health care services will be experienced. Foreign and domestic labor forces of reproductive age will be increased. Living environment changes will affect health issues. Increased numbers of vehicle movements, reduction of drinking water quality and quantity, noise, emissions, dust and air pollution will be major problems. It is recommended that in designing and implementing projects and programs on improving the capacity of health organizations; ensuring work safety and reproductive health (including issues related to HIV/AIDS) of the population in the impact areas of the OT Project, that the soum Governors should consider these issues and base initiatives on the participation of local communities.

Another potential impact of the OT Project is pressure on school and kindergarten services, their capacities and facilities due to increased population influx. There is speculation among local citizens and officials that the school drop-out rate might increase compared to the current level. If this eventuates, it will constitute a negative impact. The implementation of the OT Project may have varying impacts on the sufficiency and adequacy of teaching staff in the project impact area as: (i) professional teaching staff may decrease, leaving for other jobs; whereas (ii) the budget of
schools with an increasing number of students will be bigger. The opportunity to hire professional teachers by those schools will be increased.

Impacts on the local environment and natural resources are expected to be negative due to a few factors, which are manageable through various means and actions. Ever-increasing dust generation along truck roads and spreading dust over large grazing and pastoral camp areas, and contamination of pasture and water sources are the main concerns of the locals. Local administrations and herders expect that the mines will take decisive measures to alleviate dust-borne impacts. These impacts on the natural resources and environment are cumulative in nature, as several other projects in the area also contribute to the problem. This calls for the mines to focus on managing these impacts via pursuing enhanced environmental and resource management plans in cooperation with other actors – coalmines and contractors.

Actions and measures towards maximizing positive impacts and mitigating negative impacts that can come from the OT mine operations are proposed. These are not only those to be taken by OT, but also require the active and productive cooperation of local administrations and stakeholders. Areas where OT may need to collaborate with other mine projects and stakeholders are described.
1. INTRODUCTION

Ivanhoe Mines Limited (Ivanhoe) operates the Oyu Tolgoi Project (OT) through its wholly-owned subsidiary, Ivanhoe Mines Mongolia Inc. (IMMI). Rio Tinto plc (RT) is the major joint venture partner in the OT Project, holding a percentage of its shares and with options to acquire an additional percentage when project approval is achieved. The Oyu Tolgoi Project is in the Umnugovi aimag (South Gobi Province) in Mongolia’s Central Region. The property is approximately 550 km south of Ulaanbaatar, the national capital.

The OT Project is at an advanced stage of exploration, awaiting the conclusion of an Investment Agreement (IA) between the company and the Government of Mongolia to enable it to move towards feasibility planning and eventual construction and operation. The assessment of project impacts is a key element of project planning activities and this Social Impact Assessment (SIA) will become an important document in the suite of project management plans that will be required to move the project forward.

This SIA report describes the socio-economic impact of mining operations, as well as the key associated socio-economic aspects of environmental impacts and the cumulative impacts contributed by other mining projects in the OT area. In another section of the report, the social, economic and environmental baseline data for the area are presented.

In order to understand local stakeholders’ and communities” perceptions and assessments of the already-known impacts and those that may arise in the immediate and long-term future, a wide range of field activities on information collection were undertaken in soums in the OT Project’s impact area. Fieldwork included group discussions, group and individual interviews and the collection of secondary information from relevant soum sources, officials and annual statistics. Potential impacts that have now been and may yet be generated by mining operations and other related activities are identified in this report. It also recommends measures, which may be undertaken by the mines to mitigate such impacts. In order to assist the mines to understand the key details of the impacts, the report provides matrices that examine the nature and other key patterns of each identified impact and links to their causes.

2. CONTENTS OF THIS REPORT

Section 1 introduces the summary of this report;
Section 2 explains the content of this report;
Section 3 highlights important assumptions;
Section 4 describes related reports and their links;
Section 5 explains the purpose and TOR of the social impact assessment along with international and OT/RT standards;
Section 6 provides the description of impacts and the SIA methodology;
Section 7 presents the description of the current and proposed components of the OT project;
Section 8 provides the limitations;
Section 9 discusses the desktop and field activities undertaken during the SIA project implementation including community consultation activities;
3. ASSUMPTIONS

Certain assumptions have needed to be made in order to undertake this assessment, i.e. conditions and parameters have been taken to be fact although they are not proven and circumstances may change them. Each of these assumptions is described below and has been made explicit in order to avoid hidden bias. These assumptions should be kept in mind when considering the assessments and analyses, which have been based upon them.

Assumption 1: An important assumption is that increasing the recruitment of Mongolian workers will trigger increased employment and income for many local families. The availability of Mongolian workers who could be recruited, and their geographic location amongst soums in the affected OT area and elsewhere in the country will need to be established in order to achieve a target that local OT workers will be increased to 90% Mongolian by the fifth year from the Project’s commencement. This does not take the educational background and professional skills of available Mongolian workers into account. For various reasons it may not be possible to recruit sufficient Mongolian workers to reach this target and it may be necessary to employ more foreigners and this, in turn, may require greater operational expenditure than estimated.

Assumption 2: Another assumption is that the proportions of full-time and part-time employees within the total number of employees will not undergo sudden changes, which could affect a favourable gender-balance, wherein a reasonable number of women will be recruited.

Assumption 3: It is not possible to separate definitively the OT mine development phases in regard to years needed for each stage (i.e. construction and operation), since time and activities for large construction phases may be extended and overlapping. Therefore, the ascription of impacts to the various mine development phases may not be precise. The report further assumes that a strict single-year-based division between the Project’s individual phases is not needed to define the duration of direct and indirect impacts.

Assumption 4: It is assumed that the OT Project’s contributions to national, regional and local revenues will depend on prices obtained from sales of the main minerals: copper, gold and silver - with a peak by 2016. This assumption may be also applied to the prognosis and long-term perspectives for Mongolia’s national economic development. Any shift to either side in this time-bound aspect may require targets and related activities to be revised.

Assumption 5: It is assumed that a significant number of OT mine’s workers will come from the five soum centres surrounding the mine and will be moved between the work sites and their residential locations by bus (bus-in, bus-out – BIBO). If this does not happen, mass migration of people and families from soums in non-mining areas may occur, resulting in excessive unexpected and unbalanced pressure on infrastructure, services and other social and environmental resources.

Assumption 6: In regard to Project revenue distribution, it has been necessary to assume that soum governments will be able to access a part thereof to be transparently and accountably spent on local socio-economic development needs.

Assumption 7: Delays in approving an Investment Agreement with the Government of Mongolia have hindered and may continue to adversely affect some of OT Project’s key advancements to achieve planned targets.

An independent Integrated Development Plan (IDP) announced in 2005 outlined the Project’s two major targets, as follows:
Production is forecast to commence in mid-2008 with an open pit based at the gold-rich Southwest Oyu Deposit, the primary near-surface deposit within the Southern Oyu group of deposits.

Full production, with an initial throughput of 70,000 tonne per day (t/d), or 25.5 million tonne per annum (mtpa), is anticipated from the beginning of 2009.

Due to these delays, various key quantitative and qualitative data significant to the OT construction and operation phases, and to which the SIA study may refer, remain unclear. As long as the negotiation process is repeatedly prolonged due to the inability of the Government of Mongolia and the project proponents to reach agreement, fulfillment of the OT Project’s IDP has been slowed down accordingly. With this, some of the indicators that qualify as long-awaited positive impacts have been diluted.

In addition, aspects of the Project design may change with time, in response to economic and other factors, and these changes may affect the accuracy of impacts assessed upon the basis of earlier versions of project design. For this reason, it is good practice for impact assessments to be revised whenever significant changes to the project occur. Review of impact assessments should also be undertaken periodically in order to assess change.

Another aspect that makes the SIA of the OT mine impact area more complex are the „cumulative” impacts, resulting from a combination of effects on human/animal health and the environment from other major projects in the area, such as large coalmines. In general terms, this refers to dust generation and spread by truck traffic and damage to natural resources used in pastoral livelihoods, such as water, vegetation, soil and grazing territories. In reality, the OT mine on its own will not generate much dust and intends to minimize other impacts that cause these major environmental concerns among local stakeholders. However, no data are available to officially confirm the various other mines’ contributions to these cumulative effects caused by dust and other impacts, so people are unable to differentiate between the impacts caused by individual projects.

The SIA thus experienced some difficulties in describing cumulative impacts due to:

- The mines’ development phases differing in advancement; whereas Tavan Tolgoi and Energy Resources have already commenced production, OT is still in its advanced exploration phase.
- Multiple players vs. the broadly dispersed cumulative impacts, i.e., some mines have powerful cumulative impacts, while other mines have no directly contributing impacts. However, since the shares of individual mines in the impact’s „snowball effect” are not yet known, no steps are being taken to jointly manage these impacts.
- People’s perceptions of the same impacts vary, with those living in affected soums adjacent to the long vehicle route perceiving impacts from dust generated by hired trucks operated for Tavan Tolgoi and Energy Resources differently. Some tend to specify impacts on pasture and water, while others are more concerned about health impacts.
- Local stakeholders’ exposure to information relating to individual mines is dissimilar across soums in the affected area. As a result, perceptions and interpretations of the same impact
in terms of geographic extent vary not only across *soums*, but also across *baghs* in the same *soum*, making it problematic to qualify/quantify the significance of impacts for all those affected.

Lack of information concerning population influx in specific *soums* makes it difficult to verify the real situation in this important factor, the known cause of a number of adverse social impacts. There is an impression that many people and households have been moving from the Manlai and Bayan-Ovoo *soums* to the Tsogttsetsii and Khanbogd *soums* but insufficient data to verify this.

Poor information disclosure and dissemination at all local communities’ level is causing a certain degree of misinterpretation on the same matters in different contexts and with different assumptions. Access to key data and other verifiable information from reliable sources seems to be a powerful factor in enabling local people to understand and perceive that OT and other projects produce impacts of variable natures.

At the time that the SIA was completed, there remained a number of areas of uncertainty. These included the following:

- Timing of the Oyu Tolgoi Investment Agreement approval and the related timing to commence the first stage of construction
- The Investment Agreement content and the extent to which this may or may not prescribe OT’s roles and responsibilities in regard to local infrastructure development and other shared economic aspects
- The proposed target date to commence the Tavan Tolgoi and Energy Resources construction period and workforce requirements
- Population influx vs. the employment of local mineworkers and their dependants
- A local purchasing policy, including the strategies, capacities and reliability of local producers

**4 DESCRIPTION OF AND LINKS TO RELATED REPORTS**

**4.1 UMNUGOVI SOCIAL, ECONOMIC AND ENVIRONMENTAL BASELINE STUDY**

The Umnugovi Social, Economic and Environmental Baseline Survey (USEBS) undertaken during 2008-2009 has become a pioneering work, the first to be undertaken in Mongolia. The Survey’s results have provided an excellent database for a number of follow-up initiatives to be taken by both the aimag society and the Oyu Tolgoi Project.

It has been recognized that the USEBS had covered too large an area to be suitable for the study of direct impacts. The OT Project’s reaction to the USEBS was to commission a socio-economic impact assessment (SIA) on the project’s impact area focusing specifically on the neighbouring *soums*, namely Khanbogd, Bayan-Ovoo, Tsogttsetsii, Manlai and Dalanzadgad. The USEBS provides the baseline data for the OT SIA, as a subset of the baseline data gathered for the province as a whole. The final SIA report will include a section on the OT Project impact area

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2 The Umnugovi aimag Khural of Citizens’ Representatives, Governor’s Office and Umnugovi Development and Research Foundation. Umnugovi aimag Socio-economic and Environmental Baseline Survey, 2008. Available at www.umnugovi.mn
social and economic baseline data, and an overview of the socio-economic aspects of the OT Environmental Impact Assessment (EIA) to present key information relevant to the SIA.

4.2 INTEGRATED DEVELOPMENT PLAN

In reviewing various OT Project reports to identify possible baseline gaps in certain areas, commonalities were found linking the SIA to the OT Project’s IDP, that is available at[3] and serves as a versatile reference to crosscheck much of the information gathered during field surveys conducted in the OT Project impact area. Most importantly, the IDP includes the Operating Plan and Socio-Political Assessment, wherein the key mine development perspectives are provided, together with a synopsis of the Project’s effects on local communities.

This Plan and Assessment contain mineral resources and scheduling data covering various OT Project phases, giving clear figures and dates. In this regard, the OT Project’s IDP has guided the SIA to gain the best information in regard to the probable duration of potential key impacts.

The location of various underground deposits, mineralized anomalies and open-pit sites are clearly indicated in the IDP, as well as refined infrastructure development plans. OT Project construction and production phases are also described in detail and supported by a wealth of technological production and processing drawings.

4.3 INFLUX ASSESSMENT, HOUSING OPTIONS, WORKFORCE FORECAST

Two studies in particular: the Housing Potions Analysis[4] and the Influx Risk Assessment[5] provided the base from which to identify the causes and summarize mitigation measures on various underlying socio-economic impacts from the OT and other mining projects.

A distinct probability is predicted, according to a survey on the OT Project’s socio-economic impacts, that planned and unplanned settlement will rise in the Khanbogd soum, but, according to the SIA team’s judgment, the same pattern of population in-migration is predictable in other soums in the OT Project area.

Referring to Table 4.1 below, it can be assumed that no major in-migration is anticipated from the aimag capital.

<table>
<thead>
<tr>
<th>Soums</th>
<th>Yes</th>
<th>No</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dalanzadgad</td>
<td>26.5</td>
<td>50.0</td>
<td>22.4</td>
</tr>
<tr>
<td>Khanbogd</td>
<td>13.0</td>
<td>65.0</td>
<td>20.3</td>
</tr>
</tbody>
</table>

Source: The OT Socioeconomic Impact on South Gobi Local Development, Social Research Institute, National University of Mongolia, June 2006

In the main, in-migration is anticipated from other soums to the OT Project area.

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The Ivanhoe/OT Population Influx Report suggests that the entire Tavan Tolgoi workforce could range from 800 to 3,000, depending on whether the mine’s development is capital- or labour intensive. At this stage, it is assumed that it will be the former and means that Tavan Tolgoi initial workforce could be approximately 800. Based on the above assumptions, the ER mine, the main Tavan Tolgoi mine and the BB mine would have a combined workforce of approximately 1,500 during 2015, and 2,000 during 2020. This would result in a population influx of 4,700 during 2015 and 7,000 during 2020.

Investments in infrastructure by the Government or the mining companies, such as, paving roads between the soums and the aimag centre, could result in dramatic population dynamic changes.

<table>
<thead>
<tr>
<th>Baselines</th>
<th>Rate</th>
<th>Population 2015</th>
<th>Rate</th>
<th>Population 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (high baseline)</td>
<td>1.50</td>
<td>16.700</td>
<td>1.40</td>
<td>18.000</td>
</tr>
<tr>
<td>Medium</td>
<td>4.00</td>
<td>19.800</td>
<td>3.00</td>
<td>23.000</td>
</tr>
<tr>
<td>High</td>
<td>6.00</td>
<td>22.600</td>
<td>4.00</td>
<td>27.500</td>
</tr>
</tbody>
</table>

Source: Southeast Gobi Urban and Border Towns Development Project, ADB, 2009

Dalanzadgad is also emerging as a key staging point for tourism into the Gobi, and could add considerably to employment opportunities in the town.

These and other relevant aspects of these two reports are discussed in detail in the appropriate sections of the SIA report.

4.4 ECONOMIC AND FISCAL IMPACTS OF THE OYU TOLGOI PROJECT

The report on the Economic and Fiscal Impacts of the Oyu Tolgoi Project on Mongolia (for source, see footnote 1 above), wherein the background concepts of OT impacts are summarized, starts with a condensed description of the mining activities and potential impacts. The nature of the OT Project’s impacts is expected to differ across the Project’s phases, since these often involve a variety of activities. During the construction phase, for example, the purchasing of goods and services associated with building the facilities is the main driving force of the impacts. During the operational phase, the mining process output, together with associated demands for goods and services required as inputs thereto drives the impacts. Impacts of the exploratory and closure phases are similar to those for the construction phase.

4.5 PERCEPTIONS STUDY ON WATER USE IN THE KHANBOGD SOUM

Perceptions on water supply, water quality and the Oyu Tolgoi project impact on herders’ water supply were identified for three focus areas. Three focus areas are the Gunii Khooloi, the Oyu Tolgoi and the Planned Road to the Gashuun Sukhait border trade point.

This study deserves as one of the key information sources for the current SIA that it conducted a wide range of analyses on the local perceptions of water availability and supply and identified

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6 IMMI/CPR Perceptions study on water use in the Khanbogd soum, August 2007
key positive and negative impacts of OT project not only in terms of water issues, but also in other areas of local life.

Based on the analysis of the study findings a council of water users was suggested as a mechanism on engagement and participatory process with local stakeholders.

4.6. ENVIRONMENTAL IMPACT ASSESSMENT

For the OT Project, detailed environmental impact assessments (EIA) were undertaken on the following projects and the reports were approved by the Ministry of Nature and Environment.

- EIA 2004 of OT-Gashuun Sukhait road and adjacent infrastructure
- EIA 2005 of the project on use by OT of underground water resources in Galbyn Gobi and Gunii Khooloi
- EIA of the OT water supply pipeline project
- EIA 2007 of the copper and gold mining and processing project at the OT deposit
- EIA of the coal-fired power plant
- EIA 2007 of the project on moving the location of the local airport
- Report on revised and amended infrastructure assessment

Summary of the OT environmental impact assessment is available at www.oyutolgoi/50946/reports/client/idp08/07environment/07environment.doc - Oyu Tolgoi project - IDP08 Section 7 – Environment

5 PURPOSE OF SOCIAL IMPACT ASSESSMENT

5.1 PURPOSE

Why undertake social impact assessment and collect baseline data?

Social impact assessment is a relatively new field of enquiry, the term „SIA” having first emerged in the United States in the early 1970s, during the preparation of the Environmental Impact Statement for the Trans-Alaska pipeline. In general terms, an SIA represents efforts to assess, as far in advance as possible, the social consequences likely to follow from the development of a specific project7.

What is an SIA?

Social Impact Assessment includes the processes of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by

those interventions. Its primary purpose is to bring about a more sustainable and equitable biophysical and human environment.\(^8\)

Some of the important features of the SIA process defined in the above explanation by the International Association of Impact Assessment are that:

- Impact assessment promotes community development and empowerment, builds capacity, and develops social capital (social networks and trust)
- SIA contributes to the process of adaptive management of projects and therefore needs to inform the design and operations of the planned intervention.
- SIA builds on local knowledge and utilises participatory processes to analyse the concerns of interested and affected parties. It involves stakeholders in the assessment of social impacts, the analysis of alternatives and the monitoring of the planned intervention.

Usually, an SIA will contain the following elements:

- Baseline data on population, health, education, economy, housing, industry, agriculture, infrastructure, culture etc.
- Projections of changes expected, based on trends from past change
- Estimates of the likely impact of project activities on local communities
- Suggested strategies for mitigating negative impacts and enhancing positive impacts
- Suggested methods for monitoring and evaluation

**5.2 THE PURPOSE OF THE OT SIA STUDY**

Social impact assessments are primarily undertaken for two major reasons:

1. There is a legal requirement to do so in order to gain project approvals, and
2. The project proponents want to understand the social environment (people, culture, economy) in which they will be operating, in order to minimise negative impacts upon local communities’ way of life and maximise local community benefits.

The second reason is the principal motivation behind IMMI’s decision to undertake an SIA of the Oyu Tolgoi project. This decision may not have been taken for purely altruistic or charitable reasons, as IMMI is a mining company, not an aid agency. Nonetheless, the company wishes to contribute positively to the quality of life of host communities and to be seen as a “good neighbour”. The decision to learn how best to co-operate with your neighbouring communities also makes sound economic sense. Good community relations, based upon sustainable development and co-operation principles, in addition to improving local living standards can:

a) Improve the working atmosphere both for local and migrant workers, thereby increasing motivation and productivity, and

b) Improve the company’s international reputation, enhancing share values and increasing the company’s chances of winning new project approvals in other locations.

In addition, if local businesses develop to the point where local procurement of goods and services becomes the rule rather than the exception, the project can save on import and transport costs, to the benefit of their profits as well as the local economy.

5.3 TERMS OF REFERENCE FOR THE OT SIA

Terms of Reference (TOR) for this OT Project SIA were developed as a direct continuation of the Umnugovi aimag Socio-economic and Environmental Baseline Survey (USEBS) undertaken during 2008-2009 that had included soums within the direct and indirect impact area. TOR required the research team to identify and place in context the impacts arising from the OT Project and other projects in the area, together with recommendations on mitigation.

The overall goals of the SIA were:
- To assess, as far as possible, the social and economic impacts and consequences of environmental impacts likely to follow from developing the OT and other mining projects in the OT Project area.
- Analyze all aspects that affect people, e.g. social, economic and environmental, at soum and community levels.
- Form the basis for a Social and Environmental Management Plan (SEMP).
- Maximize Mongolian inputs for the OT SIA.

The scope of TOR-identified tasks to be carried out under the contract comprises:
- Produce a subset of the Baseline study, focusing on the OT project areas; specifically the four neighboring soums (Khanbogd, Bayan-Ovoo, Tsogtsetsii and Manlai) as well as the provincial capital, Dalanzadgad.
- Analyze the OT Baseline study report to determine if there are gaps; ensure that the OT project impact area baseline includes sufficient detail for processing to impact analysis.
- Fill gaps based on the analyses; to complement the gaps with additional research and survey work; the survey team to conduct field surveys in the OT affected area to collect data, including soum official statistics and local perception concerning the temporal and spatial dimensions of impacts caused by a variety of actors and factors.
- Organize a workshop with selected experts and Advisory Committee members to develop a list of potential impacts; this workshop is to discuss field data-based descriptions of potential impacts and consequences and make recommendations for future work as the next step.
- Analyze potential impacts in detail and prepare the draft assessment report; based on the list of impacts compiled from the field survey, OT-related data provided by IMMI and recommendations from the experts’ workshop.
- Organize community workshops in the Dalanzadgad and Khanbogd soums; the preliminary impact assessment report is to be presented at the workshops in order to understand local reactions to the report and obtain inputs from communities in the OT Project area.
- Finalize the OT SIA report, incorporating all inputs.

5.4 INTERNATIONAL STANDARDS

A number of international standards exist relating to stakeholder engagement and social impact assessment that may be relevant to the OT project. The most relevant ones are the standards, principles and guidelines developed by the following organisations:
- International Association for Impact Assessment (IAIA);
International Council on Mining and Metals (ICMM) (Rio Tinto plc is a member of ICMM);
• World Bank;
• International Finance Corporation (part of the World Bank Group);
• Asian Development Bank;

This SIA has been developed in line with these standards and executed to a level of compliance, if not beyond, with the requirements of all of these organizations.

5.5 IMMI/RT STANDARDS

Ivanhoe Mines has a publicly-issued „Statement of Values and Responsibilities”, available on its website at http://www.ivanhoemines.com/i/pdf/Values-Resp_V5.pdf. In it, the company declares the following (p.2):

We place a priority on establishing and maintaining responsible exploration, development and production operations that are guided and sustained by:
• Compliance with established laws and regulations;
• Respect for cultures and customs;
• Identification and management of risks;
• Responsive and effective management of social and environmental impacts; and
• Open and transparent communication and cooperation through trust-based relationships between the company and all of its stakeholders.

This statement indicates IMMI’s commitment to managing social and environmental impacts and to open and transparent communications and building good relationships with its stakeholders. It further explains Ivanhoe’s standard practice of conducting impact assessments in order to manage and minimize the social and environmental impacts of its activities. This SIA is a demonstration of that commitment.

Rio Tinto, IMMI’s joint venture partner in the OT Project, also maintains high standards of social and environmental impact assessment and management. Rio Tinto’s statement of its approach to the full range of business practices is set out in a document entitled „The Way We Work”. This is available, in Mongolian and English, as well as many other languages, at the following web site: http://www.riotinto.com/resources/3608_policies.asp

Also available at the same site is Rio Tinto’s Communities Standard, which outlines the way in which Rio Tinto exploration and mining projects must engage with communities, gather information, and formulate plans and programs to manage social impacts. The current SIA complies with this standard.

6. METHODOLOGY

6.1 DEFINITION OF IMPACTS

The potential impacts identified within this assessment are both positive and negative in nature. Potentially positive impacts may result in positive social changes, e.g., increased employment,
induced economic growth, extended local purchases, and the opportunity exists for the company to maximize these positive impacts, through effective management, i.e., identifying and implementing benefit enhancing measures.

In contrast, negative potential impacts may result in negative social changes, e.g., settlement displacements, conflicts between local people and migrants, degraded land and environment, and the opportunity exists for the company to minimize these negative impacts and, in some cases, to convert these to positive impacts through effective management.

In addition, potential impacts can be either direct or indirect. Direct impacts refer to changes in social conditions caused by specific project-related activities, e.g., increased dust generation over non-mining areas and the loss of archaeological sites. Indirect impacts refer to changes indirectly caused by specific project-related activities, e.g., induced economic growth, larger contributions to soum budget revenues.

It is important to note that some direct and indirect impacts can add to the accumulated impacts from other imminent projects and activities in the same areas; these are called „cumulative” effects and refer to the total of all impacts in an area, when all project developments are combined.

Sub-sections of the impact assessment include:
1. Descriptions of potential impacts derived from a multiple-stage analysis to identify the following for each identified impact:
   a. Cause of impact – activities undertaken by project/s responsible for the impact;
   b. Nature of impact – whether the impact is positive or negative, as well as direct, indirect or cumulative;
   c. Geographic extent – the geographic area impacted;
   d. Duration – whether the impact is related to a specific phase of Project activity and how long the impact will persist;
   e. Magnitude – the number of people who will be affected by the impact;
   f. Probability of impact – describe the likelihood of the impact occurring, i.e., highly probable, moderately probable, or a low probability.

2. Identification of management and mitigation measures in order to find strategies for the OT project to either avoid or reduce negative impacts and enhance positive impacts. This also applies to cumulative impacts, although managing these will require the co-operation and participation of other companies.

Identification of location and boundaries of impact areas. Some special arrangements, which SIA requires, were:
   - The data and information in the OT baseline report covers only whole soums without territorial segregations within individual soums
   - Needs of SIA to address special groups of local residents based on the closeness to the main OT mine site/s
   - Need to gather and generate reliable information to understand people’s perceptions of impacts on underground aquifers in remote locations and of infrastructure, like roads
Based on the above, we have identified the locations and boundaries of areas to be covered by SIA, where different categories of impacts can be determined.

- Direct impact areas – all of Khanbogd, represented predominantly by residents in the following areas:
  - In a 20 km radius from the OT camp
  - Khanbogd soum centre
  - Gunii Khooloi underground water aquifer
  - OT-Gashuun Sukhait road
  - Coal forwarding road from Tavan Tolgoi to Gashuun Sukhait

- Indirect impact areas - Khanbogd, Tsogttsetsii, Manlai, Bayan-Ovoo and Dalanzadgad soums
- Cumulative impact areas – Khanbogd, Tsogttsetsii, Manlai, Bayan-Ovoo and Dalanzadgad soums

6.2 DATA COLLECTION AND ANALYSIS METHODS

6.2.1 Data collection

The SIA for the OT Project collected data for use in its impact assessment at soum levels, covering four soums in the OT Project area and in Dalanzadgad soum, the location of Dalanzadgad, the aimag capital, in order to ensure detailed and specific coverage of the area where the mining projects will have the most impact. The SIA employed a range of commonly used participatory techniques9 for primary data collection and analysis including:

Focus group discussions (FGDs) were used to gather common information specific to the impacts caused by large mines in the area and to clarify complex issues to supplement the secondary data. Involving approximately 8-10 people in each, FGDs were organized in all the baghs in each soum covering a variety of issues: population, cultural heritage issues; employment, health, local governance and budget revenues; natural resources; businesses, income generation and education, with particular emphasis on local perceptions and concerns.

Semi-structured interviews (SSI) were organized in each soum with 6-10 respondents - officials and various staff members of soum governments and soum-based public and private services - to clarify detailed issues and gather supportive information. SSIs were conducted within an open framework to allow for focused and two-way conversational communication.

Secondary data were collected from various organizations in each soum, focusing largely on data that are not available from official statistics and closely related to population migration, local budgeting and employment by the mines.

Of central importance in the approach and methodology applied in this study was the focus on broad participation in data collection. This was, principally, to reduce the risk of overstating one impact over another, and to ensure that the Project’s consequences are correctly assessed or predicted by local communities. Field survey guidelines and themes are provided in Appendix 5.

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6.2.2 Survey Themes

Themes discussed with local respondents during primary field data collection included:
- Local economic and business development and infrastructure
- Population
- Employment
- Education
- Health
- Cultural heritage
- Socio-economic aspects of environmental impacts
- Natural resources
- Issues concerning local government functioning and resettlement

6.2.3 Data Analyzing

In addition to collecting people’s concerns through participatory research methods, as described above, the Research Team used its own deep knowledge of the baseline conditions of the impact area and its understanding of the Project proposal to anticipate the impacts that might occur. The combination of stakeholder inputs and research analysis yielded an extensive list of potential impacts.

These impacts then needed to be categorized into High Impact, Medium Impact and Low Impact groups. This was done using the table below as an assessment guide.

<table>
<thead>
<tr>
<th>Table 6.1: Impact Assessment Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Criteria</strong></td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Geographic extent or spatial influence of impact</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Magnitude of impact (at the indicated spatial scale)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Duration of impact</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Once categorised according to the extent, magnitude and duration criteria described above, impacts could then be assessed for significance. By multiplying the levels at which impacts were measured against each of the three criteria, an overall assessment of significance could be ascertained.
When combined by the Study team with the criteria of cause of impact, whether positive, negative, direct or indirect and how likely to occur, a full assessment process for each impact was completed. By this means, the most important impacts could be focussed on for detailed assessment and for the development of suggested management and mitigation strategies. The use of these methods will become evident in the report sections dealing with each impact. This also applied to the analyses of cumulative impacts.

**Extrapolation ratio method (Constant share method).** The ratio method of projecting total population is peculiar to projections for geographic subdivisions. In this method the percentage distribution of the parent population (e.g., Umnugovi aimag) among the geographic subdivisions (e.g., soums) is observed for one or more past dates, projected to future dates, and applied to independently derived projection of the parent population. For the projection of the percentages, the percent distribution may be held constant at the last observed level or may be modified in some way to take into account of the past trend. The percent distribution may be assumed to approach a stable condition after a great number of years on the grounds that differences in fertility and mortality will have disappeared and net migration will have often dropped to zero for each area.

7. PROJECT DESCRIPTION

7.1 AREA COVERAGE

The OT SIA study covered 5 soums in Umnugovi aimag. The soums are shown in Figure 7.1.

**Figure 7.1 OT SIA study area**

![Figure 7.1 OT SIA study area](image)

Figure 7.2 shows the location of Oyu Tolgoi regionally and along the Mongolian-Chinese border.
The Project has four phases: Exploratory, Construction, Operational, and Closure. During the Exploratory phase, expenditure is incurred to determine whether the project is viable and to plan activities during the remaining phases. During the Construction phase, roads and mining facilities will be built and machinery and equipment required for operations will be purchased and installed. During the Operational phase, all activities will be associated with the mining process. During the Closure phase, activities will include dismantling and removing buildings, removing all petroleum products, chemicals, explosives, associated wastes, and rehabilitating the mine-sites. There will be some overlaps of phases during the project.

7.2. PROJECT DESCRIPTION

7.2.1 Current project components

The Oyu Tolgoi Project is in an advanced exploration stage so, although mining has not commenced a range of exploratory and preparatory activities have been undertaken, requiring facilities and infrastructure on the ground. Thus, although there will be an increase of land use and the construction of facilities when the project begins, there is already a significant presence on the Oyu Tolgoi site. In other words, many project impacts will not take place on vacant land, but will increase the impacts on land already occupied. The photograph below gives an indication of the current presence of the Oyu Tolgoi Exploration Camp.
**Existing exploratory shaft:** IMMI completed the construction of № 1 shaft to the full depth of 1,380 m in February 2008. It has a diameter of 7.3 m, is concrete lined to a finished diameter of 6.7 m, and includes headframe, hoisting facilities, power station, air compressors and ventilation equipment.

**Administration area:** An administration area is located in the construction camp in a complex including offices, security posts, first aid centre, entertainment facilities, laboratory and ablutions. Primary office space for all operations - floor area of 5,000 m² (83 offices plus 91 workstations)

**Exploration accommodation facilities:** Constructed on a total area of 4.37 ha - house and ger type accommodations for employees. The facilities include an international standard kitchen/mess hall, construction site office, HSE office, gymnasium and recreation facilities, Mongolian traditional gers and western type metal panel buildings to accommodate the construction contractor and owner staff during the construction period of the mine project. There is a boiler house to provide heating and domestic water to the camp area. An international standard plant is operated to handle treatment of daily domestic waste water and sewerage.

**Exploration mine services area:**
- Truck Shop
  - Nine Heavy Vehicle repair bays
  - Wash Bay
  - Fabrication shop, tool crib, battery storage
- Fire Station
- Heating
• Provided by a combination of auxiliary steam, live steam or steam from the start up boilers
• Warehouse
• Internal (50 m x 50 m) and External (150 m x 160 m) storage
• Raw Water (including Fire Water) has a capacity of 2 x 400 m³ tanks

**Support and mine dry service:**
• 800 seat dining hall
• Medical Center
• Sport grounds and entertainment facilities
• Mine Dry Facility - a centralized permanent operations facility provided for all site staff to shower and change from work operations

**Explosives magazine:** An explosives magazine has been established on site to store explosives. It is located in an area separated from other facilities at a safe distance required for such installations. The site has been fenced, bunded, and has lighting provided and 24-hour security. It is not anticipated that there will be any need to expand this facility during construction/operations.

**Fuel storage facility:**
• Lubricant Storage Area
  o Long term storage (1-3 months)
  o Loading and off-loading facilities
• General Vehicle Fuel Facility
• Mine Fleet Fuel Facility
• Diesel Power Station Fuel Facility

**Existing road network:**
• Regional Roads - OT and its support structures use earth roads connecting main supply areas, e.g. Ulaanbaatar, Choir and Dalanzadgad, as well as neighbouring soums
• Internal (within the camp area) roads of approximately 26 km of graded gravel construction with dust suppression agent
• Access roads to towns
• Detours around project site
• Access to the water supply borefields

**Existing power source and distribution network:** As a self-provided source, the OT operates a diesel station 25-32.5 MW for camp and for the initial construction power to the site

**Existing water sources and supply facilities:**
• For the exploration needs and to maintain supply to the OT camp, multiple deep wells within the current fenced area are used
  • Domestic water has a capacity of 2 x 200 m³ tanks with variable speed control to provide steady pressure to consumers
  • Potable water provided – capacity of 8 m³/hr
Current job categories and numbers (include separate national and expatriate numbers):

Table 7.1: The total current manpower estimates

<table>
<thead>
<tr>
<th>PROJECT TOTAL</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Total: National</td>
<td>1,009</td>
</tr>
<tr>
<td>Project Total: Foreign</td>
<td>170</td>
</tr>
<tr>
<td>Project Total</td>
<td>1,179</td>
</tr>
<tr>
<td>Project National/Expat Ratio, %</td>
<td>86</td>
</tr>
</tbody>
</table>

*Source: OT Manpower Summary (June 15th 2009)*

Land requirements (area) for the mining project:
It seems that OT may need more land than its current exploration license area. Official information suggests that the OT project has discovered some other anomalies close to current reserves. Development of large infrastructure and operational sites, for example 105 km of hardtop road and a water pipeline will occupy more area. This may mean that more land will be needed to develop and run a full-capacity mining operation.

The current exploration activities, including camps, support and exploratory activities utilise 2,508.74 hectares. During construction and operations, the project footprint will increase to 8,496 hectares.

The figures below describe the amount of land used by the current camps and what will be required for the operational phases.

1. Current camp footprint 57.7 ha in total, comprised of:
   - Construction Camp, 49.7 ha.
   - OT Camp, 4.4 ha.
   - Khanbogd Camp, 3.6 ha.

2. Increase during construction and steady state.
   - Construction Stage camp footprint will increase 12.1 ha.
   - Consolidated Contractors Camp, 12.1 ha.
   - Steady State camp footprint 11.7 ha. (assuming the operation camp plus Master gers)

Broken down into greater detail, the following table lists the additional land that will be required for the fully functioning mine and during construction.

7.2.2 PROPOSED PROJECT COMPONENTS

The Project, as presently planned, will consist of the following major components:

- The open pit areas;
- Underground mine complex;
- Rock waste dumps associated with the open pits;
- Ore treatment plant (TP);
- Administration offices;
- A mine services area;
Construction camp, where offices, accommodation area, service facilities are located;
Fuel storage facility;
A tailings storage facility (TSF) associated with the treatment plant;
Haulage roads between the open pit areas and the treatment plant;
Overhead power line;
Airstrip;
Water pipeline;
Access road to the Tavan Tolgoi-Gashuun Sukhait railhead;
105 km hardtop road from OT to Gashuun Sukhait;

Table 7.2: Additional Land Requirements

<table>
<thead>
<tr>
<th>Description</th>
<th>Area km²</th>
<th>Hectares</th>
<th>Description</th>
<th>Area km²</th>
<th>Hectares</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste rock dump area</td>
<td>13.0</td>
<td>1,301.4</td>
<td>Coal fired boiler plant</td>
<td>0.009</td>
<td>0.1</td>
</tr>
<tr>
<td>Tailings storage facility</td>
<td>12.1</td>
<td>1,211.5</td>
<td>Permanent camp</td>
<td>0.2</td>
<td>17.8</td>
</tr>
<tr>
<td>Hugo and other underground mines with subsidence zone</td>
<td>9.8</td>
<td>988.8</td>
<td>Sewage treatment plant</td>
<td>0.05</td>
<td>0.5</td>
</tr>
<tr>
<td>South west Oyu open pit</td>
<td>1.7</td>
<td>174.9</td>
<td>Construction camp</td>
<td>0.3</td>
<td>35.5</td>
</tr>
<tr>
<td>Central Oyu open pit</td>
<td>0.8</td>
<td>82.5</td>
<td>Coal storage building</td>
<td>0.05</td>
<td>0.5</td>
</tr>
<tr>
<td>Fence</td>
<td>64.4</td>
<td>6,466.1</td>
<td>Boiler house</td>
<td>0.01</td>
<td>0.1</td>
</tr>
<tr>
<td>Substation</td>
<td>0.4</td>
<td>3.6</td>
<td>Warehouse</td>
<td>0.01</td>
<td>0.1</td>
</tr>
<tr>
<td>Coarse ore stockpile</td>
<td>0.1</td>
<td>1.2</td>
<td>Tailings and reclaim drainage pond</td>
<td>0.03</td>
<td>0.3</td>
</tr>
<tr>
<td>Concentrate and dewatering building</td>
<td>0.03</td>
<td>0.3</td>
<td>Tailings pump house</td>
<td>0.03</td>
<td>0.3</td>
</tr>
<tr>
<td>Truck shop</td>
<td>0.07</td>
<td>0.6</td>
<td>Explosives facility</td>
<td>0.2</td>
<td>2.1</td>
</tr>
<tr>
<td>Fuel storage</td>
<td>0.009</td>
<td>0.1</td>
<td>Hugo shafts area</td>
<td>0.6</td>
<td>6.6</td>
</tr>
<tr>
<td>Airport terminal building</td>
<td>0.003</td>
<td>0.03</td>
<td>Gate house</td>
<td>0.002</td>
<td>0.02</td>
</tr>
<tr>
<td>Gate house</td>
<td>0.002</td>
<td>0.02</td>
<td>Mill facilities</td>
<td>0.02</td>
<td>1.69</td>
</tr>
<tr>
<td>Mill facilities</td>
<td>0.02</td>
<td>1.69</td>
<td>Emergency power</td>
<td>0.008</td>
<td>0.08</td>
</tr>
<tr>
<td>Emergency power</td>
<td>0.008</td>
<td>0.08</td>
<td><strong>Total Area</strong></td>
<td><strong>83.1</strong></td>
<td><strong>8,311.9</strong></td>
</tr>
</tbody>
</table>

Figure 2 provides a general site layout of the various facilities and underground and open mines that will comprise the Proposed OT Project.
**Open and Underground pits**

Considering the lead-time required to develop and bring the block caves (underground mine) to full production, the following life-of-mine mining sequence was developed.

The Southern Oyu open pit (Southwest and Central) mine consists of nine pit stages and will be a conventional shovel-truck operation:

- Open Pit Southwest (stages 1 & 2)
- Open Pit Southwest (stages 3 & 4)
- Open Pit South & Central (stages 5 to 9)

The Hugo Dummett (north and south) and Heruga underground deposits will be mined by block-caving:

- Underground Hugo North Lift 2
- Underground Hugo South

**Production estimates and Scheduling scenarios**

- 33 years of OT Cu production = 16.4 million tonnes copper
- 33 years of OT Au production = 16.0 million tonnes oz AU

  The *Phase 1, the base case*, begins by Year 7. The open pit operation will then cease in favor of the higher-value ore from Hugo North. The base case has a mine life of more than 40 years. The initial inventory for the first 10 years of the base case consists of more than 85% Measured and Indicated resources from both open pit and underground sources. Continuing at a production rate of 85,000 t/d beyond Year 10, the project has sufficient resources to operate for at least another 50 years by expanding open pit production and exploiting the Hugo South resource.
The **Phase 2, the expanded case**, realizes the ability of Hugo North to produce at more than 30 Mt/a, with concurrent development of Hugo South and additional open pit mining to support a process plant expansion to 52.5 Mt/a (nominal 140,000 t/d). In this plan, open pit production would continue to Year 12 and the underground mine life would extend to Year 35.

**Figure 7.5: Location of Open Pits and Underground Deposits**

Operational Phase & Local Content
A summary of the job categories and numbers during the construction and operational phases:
- **Construction Phase**: major investment (over US$ 5B) over 3 to 4 years. 3,000–5,000 workers required.
- **Operations Phase**: ongoing spending over a long time period (decades) 2,500-3,000 workers required.

**Table 7.3: The total construction/operations manpower estimates**

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Total: Foreign</td>
<td>1,634</td>
<td>5,477</td>
<td>3,844</td>
<td>561</td>
<td>477</td>
<td>389</td>
<td>319</td>
<td>324</td>
<td>326</td>
</tr>
<tr>
<td>Project Total</td>
<td>5,964</td>
<td>12,903</td>
<td>10,028</td>
<td>4,094</td>
<td>3,378</td>
<td>3,506</td>
<td>3,487</td>
<td>3,542</td>
<td>3,556</td>
</tr>
<tr>
<td>Project National/Expat Ratio, %</td>
<td>73</td>
<td>58</td>
<td>62</td>
<td>86</td>
<td>86</td>
<td>89</td>
<td>91</td>
<td>91</td>
<td>91</td>
</tr>
</tbody>
</table>

*Source: OT Manpower Summary (June 15th 2009)*
Accommodation facilities:
- Additional accommodation facilities for the initial 10-15 years will be constructed adjacent to the existing Main Construction Camp.
- Depending on the choice of place where the local BIBO and FIFO workforce will be localized, additional housing will be created, either at the centers of neighboring soums or on site, etc.

Additional shafts:
- The construction of N^2 2 shaft started in 2007 with the excavation of the shaft collar. This shaft will have a finished diameter of 10 m, and will be sunk to an initial depth of 1,466 m. The shaft will be a combined production/service shaft.
  - Shaft 2 (one friction-type service hoist and one friction-type production hoist)
  - Shaft 3 (two production hoists)
  - Shaft 4 (one production hoist)

Waste Dumps & Stockpiles
Waste dumps and low-grade stockpiles will be constructed as required for each stage of open pit mining. Dump heights will vary between 50 m and 60 m depending on topography and waste volumes. The low-grade stockpile area has a capacity of approximately 100 Mt at 40 m height to accommodate all mining scenarios. An overall slope of 18° was considered in the preliminary design of the waste dumps and stockpiles. In the calculation of the waste dump capacities, it is assumed that the swell of bank volume would be 30% after taking into account some natural sorting and compaction on the dumps. These dumps and stockpiles will be located in the vicinity of the open pit areas.

Ore Excavation
The primary open pit ore loading unit will be 28 m³ bucket diesel hydraulic shovels. In normal operation, one shovel will be mining mainly ore and the other(s) will be stripping waste. The shovels will load to 220 to 240 tonne diesel mechanical trucks for transport to the mill site or the waste dumps. The ore will be dumped directly to the crusher or stockpiled for reclaim. Waste will be distributed to the dump areas either through temporary ramps accessing the upper levels of the pits or via the final designed ramps in the pit stages. An 18m³ front-end loader will be used for dropcut excavation and backup loading capacity. Conventional ancillary equipment will support the loading and hauling operations. Pit dewatering will be by diesel-powered pumps from in-pit sumps to a tank at the crusher. Pit dewatering is not expected to be a major issue at Oyu Tolgoi.

Block caving will be the mining method for underground deposits. Four sublevels will be developed under and adjacent to the ore body. The first two, undercut and extraction are necessary to initiate and sustain ore production. The others are known as the ventilation and haulage sublevels. All ore and waste rock will be lifted 1,500 m to surface by one of four friction hoists after being hauled 1,100 m from the block cave by a combination of underground loader, train, and conveyor. Collar-to-collar, the mining crews will transit roughly 6,000 m. From collar to workplace, materials and supplies will transit 3,000 m.
Ore Treatment Process and Products

The ore will be processed through conventional crushing, grinding and flotation circuits. The concentrate produced will initially be transported to customers utilising road transport and then in future years transported by rail. The initial concentrator design is based on processing 35 million tonnes of ore per year from the Southwest open pit and Hugo North block cave underground deposits. The capacity of the plant remains at this level for the first five years or what is considered Phase I. By year six of operation, a second concentrator expansion is planned to increase the capacity of the plant to 58 million tonnes per year.

<table>
<thead>
<tr>
<th>✓ Primary Crushing &amp; Conveying</th>
<th>✓ Concentrate Dewatering &amp; Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Secondary Crushing</td>
<td>✓ Concentrate Load-Out</td>
</tr>
<tr>
<td>✓ Grinding</td>
<td>✓ Concentrate Transport to Railhead</td>
</tr>
<tr>
<td>✓ Grinding Circuit</td>
<td>✓ Concentrate Transport to Smelters</td>
</tr>
<tr>
<td>✓ Flotation</td>
<td></td>
</tr>
</tbody>
</table>

Figure 7.6: Simplified Ore Processing Flowchart

Tailings Storage Facility

The open pit waste dumps will be located within the Oyu Tolgoi mining licence area and adjacent to the pits to reduce haulage distances. An ore TP will be established on the site. The tailings from the treatment plant will be discharged into the tailings storage facility. The TSF will comprise a purpose-built valley impoundment dam, with a series of decant towers for the reclamation of water and return to the plant. The initial tailing storage facility (TSF) will be constructed in cells, each consisting of two sub-cells for separate winter and summer deposition. At the 85,000 t/d production rate, the first cell will be filled in Year 14. Each cell will have similar under drainage, decant, and deposition systems. Mine waste material for the structural fill will be obtained directly from the open pits up to Year 7 and from stockpiles or local borrow areas thereafter. The outer layer of rock will provide a durable surface to resist wind erosion.
Tailings:
- Storage capacity of 750 Mt of ore processed
- Expansion up to 1,500 Mt with the addition of cells past 2025
- Base case design for 110ktpd plant capacity

Initial Starter Dam:
- Capacity – 12 month operating capacity
- Embankment Fill – 5.5m/m³
- In-situ clay material

Decant and Reclaim:
- Tailings will be deposited using a single point and spigot system depositing tails into a series of sub-cells or channels controlled by splitter dykes
- The reclaim will incorporate a floating, barge-mounted pump system that will remove supernatant and surface runoff water from the facility.
- This water will be pumped back to the plant via pipeline for reuse in the process circuits

Closure:
- The embankment slope and shape will suit rehabilitation
- The embankments will be faced with a low-permeability cover
- All natural surface water flow will be directed and monitored

Proposed roads (length, location, surface): Approximately 105 km of high-volume, high capacity truck traffic to the Chinese border, divided into 3 zones (starting from OT).
- 0 km to 25 km, gravel to suit IMMIs requirements
- 25 to 84 km, constructed in 2 stages (gravel to asphalt)
- 84 to 105 km, within Special Protected Area (asphalt)

Overhead power line from coal-fired power station to mine:
- OT plans to build a 3 x 150 MW coal-fired station. The location for this plant has not been yet identified. It may be built at the centre of the Khanbogd soum or nearby the Tavan Tolgoi coalmine pit and be completed by late 2012
- A diesel station 25-32.5 MW station will be used as standby power for the operational mine site

Proposed water sources:
- Water demand for the mine will be supplied from the Gunii Khooloi borefield which extends 35 to 75 km north of OT site by water pipelines
  Gunii Khooloi Borefield:
  - Water Projections
    - Min. = 588 l/s
    - Avg. = 696 l/s
    - Max. = 785 l/s
  - Pipeline has peak capacity of 900 l/s

Proposed railway:
There is possibility to build an access railway from the OT mine site to the railhead line connecting Tavan Tolgoi and Gashuun Sukhait, which will be completed by 2013 or a bit later. Although this will not be available at the outset, direct rail transport is considered a long-term transportation option after this initial development period.

**Administration area**
The administration area will be constructed adjacent to the process plant in a complex that will include a security post, first aid centre, laboratory, ablutions, workshop and warehouse. The buildings will be provided with potable water, electricity with an uninterruptable power supply and amenities connected to a package sewage treatment plant as required.

**Mine services area**
The area will include service office, heavy equipment workshop including a storage area, light vehicle workshop, tyre shop and wash bay. The mine services area will be located adjacent to the processing plant. An operation warehouse is to be planned which will be located in the current mine site, adjacent to the truck shop and central heating plant. A waste management centre is to be developed for handling all waste chemicals/liquids/solids during mine operation. Some of the contracted companies and service deliverers will be at soum centres, e.g. mainly in the centre of Khanbogd soum.

**Fuel storage facility**
Special areas for fuel storage will be built with a fuel station within the OT campsite area. As the number and types of vehicle and other mine machinery increases, the facility will be expanded with new capacity.

**Mining methods and equipment**
The proposed mining method will involve the conventional „excavator and truck“ type of open-pit mining. The mining fleet will comprise conventional excavators, off-highway dump trucks and road-going trucks together with support equipment.

<table>
<thead>
<tr>
<th>Table 7.4: Equipment in Service</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Shovel 42 m³ Diesel</td>
</tr>
<tr>
<td>Shovel 42 m³ Electric</td>
</tr>
<tr>
<td>220 t Class Truck</td>
</tr>
<tr>
<td>Production Drill – 39R Electric</td>
</tr>
<tr>
<td>Production Drill – 39R Diesel</td>
</tr>
<tr>
<td>Dozer – 390 kW</td>
</tr>
<tr>
<td>Grader</td>
</tr>
<tr>
<td>FEL 18 m³</td>
</tr>
<tr>
<td>Wheel Dozer</td>
</tr>
<tr>
<td>50t Watercart</td>
</tr>
</tbody>
</table>
8. LIMITATIONS

The Centre for Policy Research and the Population Training and Research Centre of the Mongolian National University have prepared this report for the use of Ivanhoe Mines Mongolia International (IMMI) in accordance with the usual care and thoroughness of the consulting profession. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined in the Proposal dated 01 February 2009 – the date of contract signing.

The methodology adopted and sources of information used by CPR and PTRC are outlined in this report. CPR and PTRC have made no independent verification of this information beyond the agreed scope of works and assume no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to CPR and PTRC was false.

This report was prepared between 02 February 2009 and 15 September 2009 and is based on the conditions encountered and information reviewed at the time of preparation. CPR and PTRC disclaim responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.

9. ACTIVITIES UNDERTAKEN DURING THE SIA PROJECT IMPLEMENTATION

9.1. THE OT PROJECT IMPACT AREA SOCIO-ECONOMIC BASELINE SUBSET

A full set of socio-economic and environmental baseline data focusing on the OT Project impact area were prepared. To prepare the report, the Umnugovi Social, economic and environmental baseline study was used as a basic source. These baseline data form Volume 1 of this study.

9.2 THE OYU TOLGOI SOCIO-ECONOMIC IMPACT ASSESSMENT SURVEY

9.2.1 Filling gaps based on results from analysing OT Project baseline report

The baseline data were reviewed to determine whether any further information would be required in order to conduct the impact assessment. In order to fill the identified gaps, secondary data from aimag/soum and national-level sources needed to be collected and reviewed as identified and described below:

1. Analyse anticipated positive macro-economic impacts by and contributions from the OT Project to Mongolia’s and the Umnugovi aimag GDP and budgets, based on data provided by IMMI. In this regard, two sets of statistical data in regard to Mongolia’s and the Umnugovi aimag GDP have been collected, and analysed. This will enable direct and indirect positive impacts by OT Project contributions to be identified.
2. Analyse population influx. As advised previously, a fair number of people and families have migrated to the Khanbogd and other mine areas in search of employment and residential citizenship and it appears that this process will continue over a long period. In view of such evidence, the need to collect secondary data from soums in the OT Project impact area was high. Data on population in- and out-migration has been collected, including Dalanzadgad. Results of the analysis of this collected data were used to project long-term population growth in the OT Project impact area.

3. Data on soum budget revenues through increased taxes and fees to be paid by the OT Project has also been made available and is to be used for various analyses and projections.

4. Information on population, employment, agriculture, education, health, businesses and local governance, covering the last four years including 2008, was obtained and will enable various gaps in the OT Project impact area socio-economic and environmental baseline subset to be filled.

5. Analysis of local competitiveness was required to identify the strengths and weaknesses of soums in the affected area in terms of retaining existing and expanding into opportunistic markets.

6. Forecast potential impacts that may result from reduced copper market prices by reviewing long-term fluctuations in world markets. It is logical to look at long-term predicted changes of the main minerals, which OT will process, and market. Significant drops may affect economy of all levels and livelihoods of many population layers. The price of copper, as an OT official report anticipates, could fall from near $2200 per tonne in 2008 to $1560 in 2043. It continues that the price of gold could fall from $400 per ounce in 2008 to $285 in 2043; and the price of silver from $6 per ounce in 2008 to $4.3 per ounce in 2043.

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10 This gap was identified in the first stakeholder workshop, described in Section 9.2.5.1 Group 1, below.
Table 9.1 Gap Identification and Field Survey Matrix

<table>
<thead>
<tr>
<th>Impact framework</th>
<th>Baseline survey indicators</th>
<th>Data Gaps</th>
<th>Methods to obtain data</th>
<th>Topics discussed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local business development</td>
<td>• Increase in prices and markets for agricultural products&lt;br&gt;• Increased competition caused by influx of outsider entrepreneurs</td>
<td>Level of diversification of trading-predominated by small services.</td>
<td>• Interviews with soum businesses&lt;br&gt;• FGDs</td>
<td>• Pushing locals out of their businesses&lt;br&gt;• Capacity to diversify and protect local businesses as a response to impacts</td>
</tr>
<tr>
<td>Finance and Banking</td>
<td>• Level of consumer loans&lt;br&gt;• Accumulation of money&lt;br&gt;• Bank services at soum level.</td>
<td>• Increase in the size and scale of business may lead to increased demands for long-maturity loans&lt;br&gt;• Decline in consumer loans due to increased salaries and wages&lt;br&gt;• Increase in money savings</td>
<td>Interviews</td>
<td>• Willingness and capacity of people (collateral, etc.)&lt;br&gt;• Changes in banking policies&lt;br&gt;• Pressure on local bank branches</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>• Level of centralized energy and water supply in settlements&lt;br&gt;• Level of access for small users outside soum centres (baghs and other settlements)&lt;br&gt;• Level of availability of soum electricity, water and services</td>
<td>• Likelihood that mine development will create reliable road, railway and energy supply networks&lt;br&gt;• Maintenance cost of the part connecting soums with energy and water supply network put up by OT/Ukhaa Khudag&lt;br&gt;• Expectations to access and share OT-built infrastructures for energy, water and other services</td>
<td>• FGDs&lt;br&gt;• Interview with person in charge of infrastructure development</td>
<td>• Expectations of small users&lt;br&gt;• Handling repair and maintenance costs for newly-built infrastructure&lt;br&gt;• Poor access for remote settlers&lt;br&gt;• High maintenance costs during project lifespan and post-project period</td>
</tr>
<tr>
<td>Agricultural productivity</td>
<td>Willingness of herders to improve livestock productivity</td>
<td>• Goals/objectives vs. requirements and needs of OT Project</td>
<td>• FGDs&lt;br&gt;• Interview with soum agricultural officer</td>
<td>• High hygienic requirement and consumer preference may trade off with local livestock producers’ capacity</td>
</tr>
<tr>
<td>Employment</td>
<td>• Employment&lt;br&gt;• Under-employment&lt;br&gt;• Unemployment</td>
<td>• Employment opportunities for locals&lt;br&gt;• Employment opportunities for outsiders</td>
<td>FGDs with community</td>
<td>• Employment/hiring locally and training&lt;br&gt;• Employment/hiring outsiders</td>
</tr>
<tr>
<td>Impact framework</td>
<td>Baseline survey indicators</td>
<td>Data Gaps</td>
<td>Methods to obtain data</td>
<td>Topics discussed</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Population            | • Population size, by age and gender  
• Household size and structure  
• Gender ratio  
• Dependency ratio  
• Aging index                                                                 | • Population age and gender structure  
• Household structure  
• Population resettlement  
• Migration                                                                 | Influx Management Study and Housing Options Study, both supplied by OT Project to have good understanding of potential impacts.                                                                    | • Impact on population size, age and gender  
• Families, inter-household dynamics and nature of mining employment  
• Impact on population resettlement  
• Outsiders” in-migration                                                                 |
| Health                | **Soum health organizations and services**  
• Health organizations and human resources  
• Type of ownership (public and/or private hospitals)  
• Health care delivery and service supports                                                                 | Access to health care services and types                                                                                                                                                                | In-depth interview with head of *soum* hospital  
FGDs with community                                                                                                                               | Changes to facilities at *soum* hospital, service delivery coverage, type and quality of services |
| Morbidity rates and differences | • Leading 10 morbidity causes per 10,000 people  
• Incidences of communicable and non-communicable diseases, by leading 5 causes  
• Incidences of STIs, per 10,000 people                                                                                                      | Epidemiological changes and mortality and morbidity differences among population groups                                                                                     | In-depth interview with head of *soum* hospital  
FGDs with community                                                                                                                               | Leading incidences of morbidity differences by age and gender |
| Reproductive Health (RH) and Family Planning (FP) services | • Prenatal, infant, under-5 mortality rates  
• Maternal mortality rates and ratios  
• Modern contraceptive use rates  
• Number of women receiving FP consultancy, etc.                                                                                           | RH access and FP services and their quality                                                                                                           | In-depth interviews with physicians  
FGDs with *soums* hospital and vulnerable group                                                                                                 | Changes to RH and FP services |
| Reproductive Health and Lifestyles of Vulnerable groups | • Knowledge of STIs and HIV/AIDS  
• Knowledge of occupational health and safety issues  
• Condom use, treatment seeking behaviour                                                                                                    | RH and lifestyle and behaviour of vulnerable groups                                                                                                 | In-depth interview with Head of *soum* Hospital  
FGDs with community                                                                                                                               | Perceived changes on RH and lifestyles of vulnerable groups  
Spreading of STIs                                                                                                                                  |
| Health issues rose due to living environment. |                                                                                                                                                  | Living environment changes in relation to health issues.                                                                                           | Check list  
In-depth interview with                                                                                                                                                                           | Perceived health issues raised linked to living environment |

35
<table>
<thead>
<tr>
<th>Impact framework</th>
<th>Baseline survey indicators</th>
<th>Data Gaps</th>
<th>Methods to obtain data</th>
<th>Topics discussed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Education</strong></td>
<td><strong>Educational infrastructure</strong>&lt;br&gt;• Electricity use&lt;br&gt;• Heating systems&lt;br&gt;• Water supplies&lt;br&gt;• Educational institutions’ capacities&lt;br&gt;• Ablution facilities&lt;br&gt;• Communication</td>
<td>Favourable study conditions</td>
<td>FGDs with community</td>
<td>Perceived impacts on educational infrastructure</td>
</tr>
<tr>
<td></td>
<td><strong>Education levels and literacy rates</strong>&lt;br&gt;• Literacy rates&lt;br&gt;• Education levels</td>
<td>Population’s education level</td>
<td>FGDs with community</td>
<td>More opportunities to obtain education and types of education</td>
</tr>
<tr>
<td></td>
<td><strong>School enrollment and participation rates, gender differences, etc.</strong>&lt;br&gt;• Gross and net enrolment ratio (by education levels)&lt;br&gt;• Gender ratio of pupils at all school levels&lt;br&gt;• Average number of students per class (by education levels)&lt;br&gt;• Percentage of pupils living in dormitories&lt;br&gt;• Drop-out rates, etc.</td>
<td>School attendance opportunities&lt;br&gt;• School drop-out rates&lt;br&gt;• Professional degrees teacher supply&lt;br&gt;• Vocational training center</td>
<td>FGDs with community&lt;br&gt;• Interviews with school directors&lt;br&gt;• Meetings with aimag Vocational school</td>
<td>Perceived impacts on school enrollment and attendance</td>
</tr>
<tr>
<td></td>
<td><strong>Availability of educational instruments, books, libraries, laboratories, course materials, etc.</strong>&lt;br&gt;• Adequacy of basic text books&lt;br&gt;• Libraries&lt;br&gt;• Computer laboratories&lt;br&gt;• Other educational intruments</td>
<td>Educational instruments, books and other course material supplies</td>
<td>FGDs with community&lt;br&gt;• Interviews with school directors</td>
<td>Impacts on educational instruments and other course materials</td>
</tr>
</tbody>
</table>

- Trafficking
- Drinking water
- Noise
- Air pollution, dust, etc.
<table>
<thead>
<tr>
<th>Impact framework</th>
<th>Baseline survey indicators</th>
<th>Data Gaps</th>
<th>Methods to obtain data</th>
<th>Topics discussed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living conditions</td>
<td>Type of dwellings and ownership</td>
<td>Changes to living conditions through access to infrastructure</td>
<td>FGDs with community</td>
<td>Access to infrastructure, such as, electricity, roads, telephones, internet, etc.</td>
</tr>
<tr>
<td></td>
<td>Sources of electricity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Telephone use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sources of drinking water</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Living and dwelling conditions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Access to services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tangible immovable heritage</td>
<td>Level of disturbance of archeological sites</td>
<td>Sites in direct and indirect areas</td>
<td>Group discussions and interviews</td>
<td>Burial and culturally significant objects and places in soum area</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Burials</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rock paintings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tangible movable heritage</td>
<td>Level of disturbance of ritual and public ceremonial places</td>
<td>Ritual places:</td>
<td>Group discussions and interviews</td>
<td>Ovoos, most respected and precious in the soum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ovoos</td>
<td></td>
<td>Persons who know these ovoos and worship places</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stupas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living heritage</td>
<td>Instances of loss of soums cultural objects in museum</td>
<td>Amounts of lost cultural heritage.</td>
<td>Interview with soum museum officer</td>
<td>Cultural objects museum wants to purchase for new exhibits</td>
</tr>
<tr>
<td></td>
<td>Loss of local craft products</td>
<td>Interest by people to sell local craft products</td>
<td>Interviews and group discussions</td>
<td>Cultural objects sold or purchased</td>
</tr>
<tr>
<td></td>
<td>Increased loss of paleontological findings in community (in the hands of soum people)</td>
<td>Community perceptions and thoughts</td>
<td>Group discussions and interviews</td>
<td>Cases of people selling and/or purchasing paleontological findings</td>
</tr>
<tr>
<td>Cultural heritage protection standards</td>
<td>Modernity and loss of traditional culture of soum people</td>
<td>Community perceptions and thoughts</td>
<td>Group discussions and interviews</td>
<td>Traditions lost in soum</td>
</tr>
<tr>
<td></td>
<td>Level of destruction of traditional knowledge systems</td>
<td>Family structure and community perception and thoughts.</td>
<td>Group discussions and interviews</td>
<td>Traditional knowledge tending to be lost</td>
</tr>
<tr>
<td>Number of examples that standards can be maintained more strictly</td>
<td>Amounts of activities at cultural heritage sites</td>
<td>Interview with soum museum officer and environment manager</td>
<td>Failures observed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amount of cultural heritage NGOs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land/Pasture</td>
<td>Reduction of pastures due to dust generation around OT site and along roads</td>
<td>Seasonal availability and conditions of pasture</td>
<td>FGDs</td>
<td>Herders expectations that pasture will become less available due to (i) increased herd size, (ii) impacts by global and localized climate changes, (iii) pastureland take associated with mining and infrastructure development</td>
</tr>
<tr>
<td></td>
<td>Reduction of grazing land availability due to dust pollution discouraging grass growth</td>
<td>Scale of diminishing availability of seasonal pastures due to large construction and road building.</td>
<td>Interview with soum government</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pastureland taken associated with mine operations, road building and energy infrastructures</td>
<td></td>
<td>Secondary data</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Talking to OT Project environmental officers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact framework</td>
<td>Baseline survey indicators</td>
<td>Data Gaps</td>
<td>Methods to obtain data</td>
<td>Topics discussed</td>
</tr>
<tr>
<td>------------------</td>
<td>-----------------------------</td>
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<td>------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>People’s ability to respond to demands from the OT Project and other markets with increased harvests.</td>
<td>Willingness and long-term commitment to increase crop activities for OT Project</td>
<td>FGDs, Secondary data, Talking to OT Project environmental officers</td>
<td>Use of high salty water for crop irrigation may cause soil salinity.</td>
<td></td>
</tr>
<tr>
<td>Potable and livestock water</td>
<td>90 Percentage of herder households relying on shallow wells</td>
<td>OT Project water consumption vs. water availability</td>
<td>Exceeded water take in major aquifers may deplete underground water levels</td>
<td>FGDs, Interviews with key informants</td>
</tr>
<tr>
<td>Level of contamination of water by foreign materials, e.g. dust, solid wastes and oil leakage, etc.</td>
<td>Potential for contamination of water with toxic chemicals and sedimentary dust</td>
<td>FGDs, Talking to OT Project environmental officers</td>
<td>Poor quality and hygiene of potable water</td>
<td></td>
</tr>
</tbody>
</table>
9.2.2 Primary data collection in OT Project area

The Consultant organized field surveys to collect baseline data, which took place from 29 March to 13 April 2009. Three teams involving consultants from both CPR and PTRC worked in the soums as outlined in Appendix 1.

Survey themes. The themes discussed with local respondents during the field primary data collection covered:

- Employment
- Economic development
- Education
- Pressures on land and pasture
- Water sources and supplies
- Health
- Infrastructure
- Community development
- Local SME development
- Cultural heritage
- Social aspects of OT Project environmental impacts
- Community consultation
- Issues concerning resettlement and associated burdens
- Visual impacts

9.2.3 Respondents/interviewees and participants

Altogether, 141 individuals selected in consultation with soum officials and bagh governors attended FGDs in the five soums. The team interviewed 41 officials from aimag and soum public service organizations to collect secondary data, and met and talked to 29 officers from soum government and aimag authorities. Meetings also included 32 individuals living in the affected area in order to collect further information and obtain confirmation on impacts from the OT Project operations. Meetings with six officials and managers from the two main mine camps helped with the collection of information on contemporary operations and plans for future mining projects.

Table 9.2: Number of interviewees and FGD participants, by soums

<table>
<thead>
<tr>
<th>Soums and mine camps</th>
<th>FGDs</th>
<th>Interviews</th>
<th>Secondary data collection*</th>
<th>Individuals</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dalanzadgad</td>
<td>31</td>
<td>11</td>
<td>7</td>
<td>4</td>
<td>54</td>
</tr>
<tr>
<td>Khanbogd</td>
<td>34</td>
<td>7</td>
<td>5</td>
<td>9</td>
<td>55</td>
</tr>
<tr>
<td>Bayan-Ovoo</td>
<td>18</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>32</td>
</tr>
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<td>Manlai</td>
<td>35</td>
<td>6</td>
<td>8</td>
<td>8</td>
<td>57</td>
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<tr>
<td>Tsogttsetsii</td>
<td>23</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>40</td>
</tr>
<tr>
<td>OT camp</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Ukhaa Khudag camp</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>141</strong></td>
<td><strong>41</strong></td>
<td><strong>29</strong></td>
<td><strong>32</strong></td>
<td><strong>244</strong></td>
</tr>
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Note: * number of soum officials met to gather relevant data
9.2.4. Findings from FGDs and other field activities

Key concerns raised by participants at FGDs and other information collection activities organized in the 5 soums are grouped and provided below:

- Environmental and human health issues. Local people were very helpful in identifying commonly shared perceptions and assessments in regard to potential impacts by the mining operations in the areas where they live

- Cumulative impacts observed in the Manlai, Bayan-Ovoo, Tsogttsetsii and Khanbogd soums caused by increased dust generation and poor dust suppression:
  - Increased dust generated by trucks:
    a. OT trucks carrying petrol from Choir across the territory of the Dalai and Uguumur baghs in the Manlai soum and Bayan bagh in the Khanbogd soum.
    b. Along the main transportation road from Ulaanbaatar via Mandalgovi, the centre of Dundgovi aimag to the OT camp throughout Tsagaan-Ovoo bagh in the Tsogttsetsii soum and Mogoi bagh in the Bayan-Ovoo soum and Javkhlant bagh in the Khanbogd soum.
    c. Dust emissions from trucks transporting coal from the Tavan Tolgoi Coal Mine to Tsagaan Khad near Gashuun Sukhait, a crossing point at the Chinese-Mongolian border. This road passes through the Tsagaan-Ovoo and Siirst baghs in the Tsogttsetsii soum, Mogoi and Kharzag baghs in the Bayan-Ovoo soum and Javkhlant and Gaviluud baghs in the Khanbogd soum.

Local people believe that building hardtop roads and railways will be the major solution to reduce dust generation to minimum levels and assist the damaged environment (soil, pasture vegetation and migrating wild animals, and other components, such as, local fauna and flora) to recover, where possible.

- Locally observed direct and partly cumulative impacts from new developments at the Ukhaa Khudag mining projects and from Energy Resources building an airstrip at the Tsogttsetsii soum:
  a. More dust is being generated than before
  b. Removing water from 14 boreholes dug by Energy Resources at Naimin Gazar by aggressive pumping is depleting the water table for shallow wells in surrounding pasture areas
  c. A large concentration of different mine constructions (Ukhaa Khudag open-pit mine site) and settlements (Ukhaa Khudag camp with over 100 trucks), as well as the airstrip being built close to the centre at Tsogttsetsii soum, rapidly degrading soil and increasing dust levels making people worry about risks to human and environmental health

- Locals argue that bad smells and light dust discharged by the coking plant at the Bayan-Ovoo soum causes localized impacts on people’s health and may become major environmental hazards as the plant expands its capacity

- Ways to use resources may undergo various changes:
Increased loss of pastureland for mine construction and infrastructure development
Pressure on pastureland and water because of reduction in the size of pasture resulting from land take and degradation by strongly diverted earth roads and dust
Increased disputes and conflicts with in-migrating herd owners may occur as locals predict that herders may migrate both for temporary stays and to seek residential citizenships at mine-rich soums

Social and livelihood issues. As the mining expands in its scale of operations, pressure on soum-based public services will be increased.

- Pressure on local services:
  - From recent experiences, implementing projects focusing on improved educational and health-care services at soums are appreciated by local communities and warmly welcomed to continue
  - From initial experience, cooperative public and private health services in the Khanbogd soum are highly supported
  - The number of schoolchildren may grow due to increased in-migration by households and, as schools and dormitories in affected soums are full, there is no spare capacity to accommodate extra children, and this has been identified as a reality at secondary schools in the Tsogtsetsii and Khanbogd soums
  - Hospitals in soums in the OT Project impact area are operating at full capacity in terms of space and human resources
  - This is also the situation at kindergartens due to poor facilities and insufficient funding

- The mines have raised a high level of expectation among local communities:
  - Every household, whether urban or rural, expects to get jobs for its members
  - People are keen to attend if the mines offer training and skill-upgrading measures to upgrade their specialization and professional skills
  - Herders want to sell meat, milk and dairy products
  - Improved roads and transportation services run by the mines is one of the common expectations among the locals
  - Increased accidents due to poor labour safety for mineworkers have become a hard-to-handle issue at soum hospitals and, according to these hospitals the number of injured workers has tended to increase, with a notable rise amongst drivers

Local economy and business development. The local stakeholders tend to see the prospects of local economic and business development in a close link with the mines as promoters and potential partners.

- Local livestock producers sincerely request that mines make the following clear to enable them to become potential suppliers:
  - Standards and other requirements for purchasing locally-produced livestock and crop products.
  - Predominant consumption patterns by mine workers and volumes of various types of products.
• Local service providers are keen to participate in providing services to the mines and expect to:
  ✓ Receive training from the mines in order to adjust their businesses to the mines’ requirements and specific needs.
  ✓ Receive support in terms of finance and facilities to diversify their businesses.

❖ Information disclosure and networking

• Disseminate information to grassroots businesses, addressing their expectations and willingness to contribute to the mines with their inputs.
• Various levels of local communities need different information about new policies put forward by the mines and their new developments.

❖ Resettlement. There is concern that construction of other infrastructures and the expansion of mining to new area/sites may trigger a new wave of resettlement.
  ✓ Local herder households in the Tsagaan-Ovoo bagh in the Tsogtsetsii soum, already living at the Ukhaa Khudag mine site, have experienced long delays in the execution of previously planned resettlements.
  ✓ Herders expect that they may be forced to resettle due to railway building and water pipelines being laid.

People from other soums frequently say that the first OT Project-implemented resettlement scheme for herder families had been good and well-organized and that other mines should learn and replicate it with even more benefits for resettled people.

❖ Contributions by the mines to local budget revenues. As the locals say, the most important positive impacts of OT is its contribution to local budgets
  • Local people recognize the positive contributions already made to soum budgets and public service organizations as important
  • People complain that contributions by the mines are not equally distributed to people
  • The mines are sincerely requested to maintain transparency and openness in regard to contributions provided to soum budgets

❖ Local governments must make every effort to ensure and maintain better services.
  • Local government personnel anticipate increased pressure on public services
  • Soum government officials request the mines to arrange training and other activities to assist them to upgrade existing administrative and public service facilities and widen the mines’ access to better services
  • A further request is that a reserve stock of medicines and other first aid items be set up at baghs where truck roads pass

❖ Protection of cultural heritage. As is the case with mining worldwide, OT cannot be ignorant to the protection of local culture and historically significant heritage.
• Local people are concerned about the diffusion of cultures foreign to local ethnic identities and customs.
• Verbal and physical evidence exists that rock inscriptions at Javkhlan Khairkhan Mountain and excavated petrified wood and valuable stones are being destroyed by outsiders.
• A sacred ovoo, worshipped by people from Siirst bagh, Tsogtsetsii soum, has been moved to another location by unknown people. They now wonder whether to worship it this year or abandon their long tradition.

The issues described above are provided as a summary of the perceptions and assessments of local people and groups in relation to the already-evident impacts and those anticipated in the future as the mine operations escalate. An extended description of processed data, which were collected during field surveys in soums in the affected areas, was presented at a workshop held in Ulaanbaatar in April, 2009.

9.2.5 Workshops and community consultation activities

According to the SIA TOR, two workshops aimed at obtaining comments and recommendations from experts in the community development field and local stakeholders in regard to the SIA study findings were held.

9.2.5.1 Workshop with selected experts and USEBS Advisory Committee (AC) members to develop a list of potential impacts

A workshop was held at the IMMI offices in Ulaanbaatar in April, 2009 to review preliminary findings from fieldwork and to assist the study team to list potential impacts from mining operations on communities in the five soums in the OT Project impact area. For the workshop agenda and a list of participants, please see Appendix 4.

The workshop discussed:
1. Presentations by IMMI/OT senior managers in respect of ongoing and planned activities within the OT mining project. These were valuable in terms of upgrading understanding about the nature of potential impacts and facilitated clarifying key issues in mine operations as influential factors.
2. Members of the CPR/PTRC study team presented findings from surveys conducted to collect field data and their presentations touched on various locally anticipated impacts as well as relevant justifications. Areas in which local people experience and anticipate impacts are:

   ✓ Natural resources and local capacities to produce livestock and crop products
   ✓ Socio-economic aspects of OT Project environmental impacts
   ✓ Economy and livelihoods
   ✓ Population
   ✓ Health
   ✓ Education
   ✓ Cultural heritage

These presentations are provided in Appendix 2.
Presentations by the study team described local perceptions and assessments concerning impacts from various mining operations: the OT Copper Mine and the Tavan Tolgoi Coal Mine.

Group discussion sessions organized during the workshop focussed on three main subjects, namely - economy and business, environment and natural resources, and social services. The objective of these group discussions was to get feedback and recommendations from experts and AC members to improve gap filling and formulate a baseline matrix of impacts.

Each group presented the results from discussion and recommendations on what should be added, as well as revision of the suggestions to the plenary session. The team accepted the recommendations by these groups as a valuable input for qualitative impact analyses. The items recommended were:

**Group 1 – Economy and Business, including Governance**

To add:
1. Improvements to local economic performance resulting from better value added and additional incomes
2. Impacts on local budget revenues
3. Macro-economic impacts (GDP, local budgets, etc.)

Data and information to be revised:
1. Analyse prospective impacts from population concentration vs. demand/increased prices
2. Analyse and recommend how local competitiveness and strengths can be improved
3. Analyse impacts on participatory economic development
4. Analyse the escalation of gaps between rich and poor vs. social inequities

**Group 2 - Social Services and Population**

To add:
1. Analyse interplays by increased influx vs. social pressures

Data and information to be revised:
1. Imbalances in population-gender ratio
2. Changes in people’s reproductive health in response to imbalanced gender ratio and unsustainable family affairs
3. Changes in traditional culture and customs, e.g. lifestyles and urbanized cultural attitudes
4. Predicted cumulative impacts due to extended settlement at Gashuun Sukhait on local life and administrative division
5. Potential impacts associated with establishing a vocational training centre in Khanbogd soum
6. Evidence of increased choice of mine-related specialization by secondary school graduates
Group 3 - Environment and Natural Resources

To add:

1. Socio-economic impacts on specially protected areas

Data and information to be revised:

1. Potential to reforest areas equal to the size of mine sites
2. Support of public initiatives, such as by NGOs and other interest groups as local efforts to protect the environment and nature
3. Possibilities to locate an environment that workers can use to respect and maintain local customs at the mine site
4. Need for intervention by Mongolia’s authorities in road building as a matter of the national infrastructure policy
5. Issues regarding the use of alternative water sources other than underground aquifers in the region, i.e. to divert large rivers, such as the Kherlen, Onon and Ongi
6. Likelihood of resettlement and its impacts
7. Non-man-made impacts on surface and underground water aquifers
8. Changes in species composition and structure of vegetation cover in areas close to main roads
9. Impacts caused by migration and habits of wild animals

9.2.5.2 Community Consultation Workshops at Umnugovi aimag

Two separate workshops were held in Dalanzadgad, the aimag capital, and in the Khanbogd soum to receive feedback comments and proposals based on preliminary results from community concerns and assessment of impacts from mining operations in the OT Project impact area, undertaken by the CPR/PTRC SIA study team. For agendas at these workshops and lists of participants, please see Appendix 3.

The two workshops discussed:

1. Presentations by IMMI/OT senior managers concerning on-going and planned activities within the OT mining project. These were to update the workshop by looking at the environmental, social and economic aspects.
2. Members of the CPR/PTRC SIA study team presented preliminary results from an analysis of local community concerns in relation to the potential impacts and the matrix-based descriptions of the nature of these potential impacts. The presentations touched on various anticipated impacts and their socio-economic and environmental consequences. The areas, most sensitive to impacts from mining operations by the OT Project and other mines are:

- Natural resources and local agricultural capacities
- Socio-economic aspects of environmental impacts
- Economy and infrastructure development
- Population
- Employment
- Public health
- Education
- Cultural heritage
Presentations by the study team described aspects of most concerned impacts by various mining operations: the OT Copper-gold Mine and other coalmines.

Feedback and recommendations from participants was received through open commenting and distributing comment submission forms. Each participant at the workshops in the Khanbogd and Dalanzadgad soum received a comment submission form. After the workshops, 26 participants at the Khanbogd workshop (57.7 percent) and 64 participants at the Dalanzadgad workshop (64.0 percent) returned completed forms. With this arrangement, the feedback from the questionnaires was included in the summaries of the Q&A from both workshops.

9.2.5.3 Working group sessions

The workshop at Khanbogd soum organized five working-group sessions to discuss the presentations by IMMI/OT and by the SIA study team. The themes of these group discussions were:

1. Natural resources and environmental issues
2. Population and employment
3. Education and cultural heritage
4. Economy and infrastructure
5. Government services, resettlement, crime/public safety

Specific recommendations on what should be added, as well as revision suggestions were presented by each group. The team accepted the recommendations by these groups as a valuable input for qualitative impact analyses and for designing mitigation measures together with monitoring and evaluation. The items recommended were:

Working Group 1 – Economy and infrastructure

To add:
1. Workforce localization policy and related procedural and organizational measures
2. Encourage cooperation among local businesses as a means to improve competitiveness.
3. Build houses at soum centres for OT Project workers.
4. Analyse potentials and opportunities for mine-site tourism.
5. Opportunities to open new tourist routes involving mine sites.

Data and information to be revised:
1. Limited interference by local government in private sector businesses
2. Capacity-building for government services by equipment and facility upgrading
3. Improved transparency and accountability in relation to contributions by OT and other mines to soum budget revenues

Group 2 – Government services, crime/public safety and resettlement
To add:
1. Revision of resettlement policy to secure standard relocation for those affected by infrastructure to be built off the mine site/s
2. Draw up effective mechanism to regularize information exchanges and feedback
3. Discuss the need to develop a crime management program
4. Include Umnugovi NGO network in monitoring and evaluation

Working group 3 – Population and employment, including cultural heritage

To add:
1. Need to implement a separate program to train professional workers and for skills upgrading, based on inputs by both local government and mines
2. Conduct a survey to identify local people’s and the workforce’s basic education status.
3. Establish a regional vocational training centre (mining)
4. Employment vs. certificated training
5. Improved language proficiency vs. employment opportunities

Data and information to be revised:
1. Recruiting health-certificated foreign workers
2. Issues of concern for short-term in-migrants
3. Improving legal environment for population management

Group 4 - Environment and natural resources

To add:
1. Waste management at settlements
2. Nurture and restore damaged pastureland by planting and irrigating perennial forage cultivars

Data and information to be revised:
1. Extend participation by local communities in environmental monitoring and evaluation by appointing a joint working group/s, where representatives from affected communities are involved on an alternative basis
2. Need for effective local administration to ensure that user and possessor rights for herders and other stakeholders are legally secured by issuing certificates and contracts
3. Undertaking a survey on wildlife migration, based on past and present patterns
4. Support public, such as NGOs and other interest group, initiatives for environmental and nature protection
5. Improve water supplies in under-used and unused grazing areas, as compensation for pastureland take, by providing new and rehabilitating unused wells

Working group 5: Education and health

To add:
1. Discuss possibilities for private schools to emerge as alternative educational institutions
2. Trade-offs between local school programs and those of in-migrants
3. Need to develop clear and feasible policy for cultural heritage protection by the mines.
4. Need to upgrade skills and knowledge for local school managers and teachers
5. Potential to develop private health services

9.2.5.4 Comments and Recommendations from plenary sessions

9.2.5.4.1 OT SIA community consultation workshop at Khanbogd soum

The workshop stimulated active face-to-face Q&A between attendees and presenters. This summary outlines the comments, concerns and recommendations that directly and indirectly touch on matters covered in the OT Project SIA.

General issues and assessment methodology:
- The methodology used is based on society’s high responsibility for the environment, and approved by the International Association of Impact Assessment as suitable for the main purpose of reducing all negative impacts and increasing positive impact potentials.
- The internationally recognized methodology used in the SIA is the correct approach; however, the peculiar and distinctive characteristics of oriental culture and Mongolian traditions and customs was taken into consideration and appropriately included.
- Positive concerns and perceptions raised by local communities in regard to OT Project implementation are accepted as approximately 70-80% valid and OT Project may therefore, focus strongly on maximizing positive concerns raised by locals.
- Local people have developed an incorrect perception that the mining operations are to excavate the land and pastures on which they and herders have been living for a long time, so that the possibility of mining has strongly influenced people’s approach to caring for the environment in which they live.

Population and employment:
- Population influx, or in- and out-migration, has already begun and been extensive in soums in the OT Project impact area and serious consideration may, therefore, be given to how the abovementioned positive concerns are to be realized.
- According to a report by responsible persons at OT Project, employees will reside in the Khanbogd, Manlai, Bayan-Ovoo, Tsogtsetsi and Dalanzadgad soums, and this is seen as a strategic, targeted and prospective decision.
- As a result of this, population concentration tendencies in the Khanbogd and Tsogtsetsi soums will decline, whereas population in-migration to those and other soums will remain stable.
- Soums are happy cooperate with OT Project management to provide favourable services needed to develop a camp for OT workers and to provide services and support for Project employees.
- Soum governments, organizations and residents are committed and looking forward, at least mentally, to cooperating in terms of decision making on issues relating to the OT Project (Governors of the Bayan-Ovoo and Manlai soums).
- There is a great need to improve civil registration and information relating to population migration and to update existing legal requirements. For example, migration and movements to the Khanbogd soum have increased significantly since the OT Project started. A
large number of single residents have migrated in and, for instance, the 120 households added in Javkhlanbagh will be registered as households, according to the official regulation, but registering single in-migrants will cause problems.

- OT Project influx management and localization will be successful provided consideration is given to the issue of a potential decrease in populations at some soums due to out-migration, already a reality in the Manlai and Bayan-Ovoo soums where residents may move out steadily. A better option would be to seriously consider this potentially negative impact by locating OT Project employees at all soums within the OT Project existing impact area

- Incorrect information that the OT Project will recruit only residents from Khanbogd should be corrected immediately and correct information distributed officially among residents at soums in the OT Project impact area. This clearly shows how important it will be for OT to have an open policy in terms of employment

- A survey is required on household dynamics among the OT and other mine employees, such as, divorces, children’s rights, etc. It will also be necessary to develop a special project or program to address children’s rights and to ensure the „family-friendly” employment policy is supportive

- The gender-ratio issue also needs consideration (this ratio may change, as it is unbalanced) and solutions are be identified as soon as possible. The study team is requested to include it in their recommendations

- Local government and the OT Project work together to register short-term in-migrants, and organize activities for them in order to improve their social interaction and commitment

**Health**

- The workshop has noted that five points where dust monitoring is being carried out are at places where dust has not been a problem and accurate information is thus not being provided for the locals. In addition, the OT Project is advised to cooperate with other mining companies where these problems have been overcome by reducing dust generation and spreading during recent years

- Official statistics suggest that STDs have tended to increase country-wide, and, as the mining sector employs young sexually-active people, STDs may be an issue of great concern. Hence, training and helpful messages should be disseminated among residents and employees to improve awareness. In addition, labour imported from China may carry STDs risks, and this issue must be considered during the survey

- Training and information dissemination in regard to STDs may be organized for residents and soum hospitals work to establish cooperation with the OT Project

- Health issues will not be addressed successfully without electricity, and soum governments and the OT Project should make further efforts in this regard

- Re-equip the hospital at the Khanbogd soum as an inter-soum clinic hospital and upgrade a diagnostic laboratory

**Education**

- There is a lack of skilled teachers at the soums. Current teachers’ knowledge and skills are unsatisfactory and soum governments and OT may implement projects or programs to address this issue.

- A vocational training centre may be established at the Khanbogd soum, as the main provider of specifically trained employees and to train and prepare future workforces for mining.
As the SIA indicates that reduction of school drop-outs is impossible, this issue needs to be included in its recommendations.

The OT Project is requested to expand its student support grant program to include schoolchildren.

Cultural heritage

- During the exploration and construction phases, respect should be shown for ancient burial and gravestone sites, with reports submitted to local governments, to avoid making people feel uncomfortable.
- According to a report by the OT Project, paleontological surveys have been undertaken in the licensed mine area and in areas where roads and the airstrip are to be built. However, no soum governments or relevant authorities have received official reports. The OT Project is advised to provide soum authorities with copies of reports on all surveys conducted, as well as results and possible discoveries.
- Ancient rock inscriptions and paintings at Javkhlan Mountain in Khanbogd soum have been obliterated or copied and women show themselves by walking on the peaks against local customs and traditions. Local people do not see these as good attitudes.
- A „discovery“ is always good news, and financial assistance may be provided by OT project to protect such discoveries, both heritage sites and artefacts which have been found and will be discovered during later stages of mine operation.
- The OT Project, soum governments and NGOs are advised to cooperate towards the preserving cultural heritage and reduce potentially negative impacts and, in order to assist in cultural heritage protection; local residents must receive leaflets with adequate and accurate information. At present, the Khanbogd soum government is drawing up a soum introduction brochure with a collection of photographs and it would highly appreciate OT Project cooperation in this regard.

Employment

- The SIA study team should comment on the work schedule for miners, as they now work continuously for 56 days, followed by continuous 14 days off. Is this schedule acceptable in terms of the Law on Labour and other relevant laws?
- From this year, in addition to their duties, State environmental inspectors are to be in charge of mining, environment and geology and will need re-training and skills upgrading abroad. This is an area where the OT Project may cooperate with soum authorities and assist them in solving this issue.
- OT Project should inform the locals about demands and requirements for local employment and recruitment from the local area and keep the workforce up-dated on such information.
- OT Project may not only consider employing local people for the Project, as there are large numbers of unemployed people at the labour market in Mongolia.
- Unemployed young people may be trained to upgrade their professional skills.

Economy, business development and infrastructure

- Promptly formulate a joint-decision with the Government on what type of energy source will be built in the OT Project impact area.
The current situation in regard to electricity in the OT Project’s impact area, i.e., in the Khanbogd, Manlai and Bayan-Ovoo soums, is unsatisfactory, and expectations are still very high. At the very beginning, OT Project announced that adequate electricity provision would be the first requirement attended to in its impact area.

The study team believes that the OT Project will provide limited support for local initiatives in regard to setting up small- and medium-sized enterprises (SMEs), and future recommendations should include serious consideration of this matter by local communities.

Providing opportunities for OT Project workers’ family members should be included in actions to set up SMEs.

Construction of a hardtop road from the OT Project to Gashuun Sukhait, from OT site to Ulaanbaatar and from OT site to Dalanzadgad, should be discussed as an option to reduce dust and improve local infrastructure.

Environmental aspects

- There is a risk that shallow wells and other open water points may disappear or that underground water levels may be lowered if the OT Project uses too much water from underground aquifers. Therefore, recommendations made by the SIA should include water-level monitoring and responsibility being accepted by OT Project if the local water supply is seriously reduced.
- Once mining operations start, land, pasture and the visual environment will be damaged and definitely undergo changes, affecting peoples’ mental well-being.
- SIA recommendations should include addressing negative impacts from the dust-polluted environment on human and animal health. Livestock mortalities and various illnesses are caused by dust generated by coal truck roads.
- Small- or medium-sized plants being set up to recycle discarded mining materials should be a priority for both the local authorities and the OT Project. A survey is requested to be conducted and support provided.
- Since the OT Project started, wildlife migration from the surrounding OT Project impact area has intensified and all relevant companies, organizations and local governments should give attention to reducing such negative cumulative impacts.
- Wild animal populations are decreasing and migrating away from the OT Project impact area and are not expected to return to their native habitats. This signals the need to develop a program on „Wildlife Protection“.
- Activities for environmental rehabilitation should be broadened and the OT Project is to cooperate with local governments to promote participation by local residents in the rehabilitation work.
- Locals recommend that OT and other mines should introduce only the latest cutting-edge technologies to reduce dust emissions from tailings dams and other waste storage areas. – In Erdenet it has been big problem
- A survey on water resources across the Umnugovi aimag may be conducted to ensure that no underground water levels will be lowered as a result of mining operations.

Natural resources and their utilization

- Recommendation from the SIA team should include the issue of potential changes to livestock herd size and herd structure in the area as a result of local purchases. It is predictable
that the present herd structures will change, for example, cow and sheep numbers will increase and intensive farming will be encouraged in the mining areas

- Support for local herders and producers may be provided to local herders to make a reasonable shift to intensive farming in order to meet mine demands
- Demands for services will increase according to the OT and other mines” and their employees” requirements for meat, dairy, and other livestock-originated products supply.

**Local government services**

- For several significant reasons local governments will need specific support and cooperation from the OT Project:
  - Resident numbers at *soums* have risen and further escalation is expected with commencement of the construction and operational phases of the OT Project. In-migration will increase as many are interested to be employed at the OT mine, so that a large number of rural households at other *soums* in Umnugovi *aimag* and in the OT Project impact area will want to move to the *soums* in the OT Project impact area, and *soum* officials and *bagh* governors” workloads will be greater than ever before
  - There is a trend for numerous residents, particularly OT workers, to be inactive and not contribute to or participate in social activities organized by *soum* authorities, for example, only 6 out of 400 non-permanent residents participated in the last Presidential Election
  - Some *bagh* governors do not even recognize residents belonging to their *baghs*, and are less able to work with them due to significantly increased workloads caused by in-migration
- Government should provide support to create social worker positions at *bagh*-levels and OT”s contribution may be required
- *Soums* in the OT Project impact area need support to upgrade the facilities and equipment required to distribute information to residents

**9.2.5.4.2 OT SIA community consultation workshop at Dalanzadgad soum**

Although the workshop at Dalanzadgad *soum* had no working-group discussions, it had an open-ended community consultation workshop during which attendees made comments and recommendations on the OT Project key aspects and their impact on socio-economic life and the environment.

**Population**

- Gradually increasing resident numbers in the *Aimag* may be resulting from the OT Project employment policy and an accurate population projection is therefore required on which to base employment and localization/housing measures.
- Accurate registration is needed to manage population influx and this, in turn, may require re-training for the civil registration and information officer.
- An additional survey may need to be undertaken to identify indirect impacts caused by in-migration.

**Health**

- Building a new hospital may be included in the SIA recommendations on what is expected from the OT Project as a major world-level mining operation and, the *soum* hospital
will therefore, require fundamental upgrading with the latest health equipment and apparatus. Doctors” and nurses” knowledge and skills are to be considered, as well as a decisive factor to improve services.
  - The OT Project is requested to provide support to upgrade the Bayan-Ovoo **soum** hospital.
  - A survey needs to be conducted to identify the main causes of abnormal foetus” occurrences and births of disabled babies.

**Education**
  - Upgrade the educational infrastructure and material base at the existing vocational school in Umnugovi **aimag** to expand training for mineworkers.
  - The OT Project is requested to take into consideration that the **aimag** governor’s Action Program anticipates establishing a branch of the Science and Technology University at the Dalanzadgad **soum** centre and may consider expanding its Student Support Program by providing more opportunities for training abroad.

**Employment**
  - As one of the largest mining operations of its kind, the OT Project should implement a specific employment policy allowing more people aged 40 and above to be recruited.
  - Active broadcast of OT’s employment and recruitment policy, as well as workforce requirements, together with job descriptions and requirements, to job seekers.
  - New graduates interested to be employed at the OT Project need accurate and timely employment information.
  - The SIA should clarify labour-safety issues and recommend specific measures.

**Economy, business development and infrastructure**
  - Include a recommendation to upgrade Dalanzadgad **soum** as a valuable and positive input by the OT Project to improve living conditions.
  - The OT Project housing policy appears to focus more on business aspects and needs amendments concerning various social and environmental aspects.
  - The OT Project would get more cooperation from local authorities by working toward integrating its development policies and actions with the local long-term development program.
  - The OT Project socio-economic and environmental development should be as comprehensive as that of the Erdenet Project, since local SME support, which may be a key development strategy, is very important for local development.
  - As small local SMEs and businesses are less compatible with large companies, the OT Project should consider and make every effort to realize its local business support policy and principles. The logic is that local businesses may not become more viable with the OT Project support.
  - Training for local businesses is essential since they lack the experience and skills required to supply large mining operations such as the OT Project.
  - Commencement of the OT Project Production phase will increase demands for various services and the Umnugovi **aimag** people should, therefore, be well prepared and work with clear goals.
• The OT Project support may be required to keep up with the mines” increasing demands for food and food products, particularly to establish intensive livestock/poultry/pig farming and crop growing.
• The OT Project should cooperate with other mine projects to solve problems associated with infrastructure development.
• Incomes for workers and businesses cooperating with the OT Project would be high and are likely to increase consumer prices, which may in turn adversely affect low-income groups with poor people/families and pensioners. These contentious impacts should be carefully assessed and appropriate recommendations should be included in the recommendations.
• One potential area to maximize positive impacts by the OT Project would be to support livestock-processing SMES and the production of ready-to-consume items.

Environmental aspects
• As part of the environmental aspect, it is proposed that alternative water sources should be investigated in case shallow and open-water sources in the OT Project impact area are reduced due to OT’s consumption from the underground aquifers.
• Green areas may be created as part of the environmental rehabilitation program. For instance, if the OT Project covers a 250 ha area, the size of the green area may be the same. The area in Gunii Khooloi where water is extracted should be reforested. All these activities should start as soon as possible.
• The OT Project may support individuals and organizations engaged in the local green movement, as well as initiatives to reforest and establish water-storage dams.
• Explanations for problems revealed in assessing the OT Project water use should be based on sound scientific and technological data to ensure that people gain a proper understanding in order to avoid misunderstandings among the locals.
• Information, local perceptions and assessments by other professional agencies about flora and fauna must be included in the SIA report, together with follow-up recommendations.

Natural resources and their utilization
• It is well known that natural resources include various components and multiple structures and damage or degradation to one or some parts of this system causes eventual reactions in other parts. The OT Project’s environmental protection and conservation policy should therefore be strictly ecosystem-oriented.

Community relations
• The OT Project resettlement and relocation plans should be free of discrimination with regard to those to be affected, be they from the Khanbogd soum or from the OT Project impact area, with the first priority to satisfy the needs of people being resettled or relocated.
• Despite the evident great need to work in cooperation with NGOs in Umnugovi aimag, it should be noted that neither the OT Project nor NGOs have actively developed good partnerships-based cooperation.

Cultural heritage
• Establishing an independent museum to display significant historic and cultural items discovered by the OT Project would provide valuable heritage conservation input.
• The OT Project is also requested to take requirements for upgrading and repair of local museums and improving storage facilities into account.

9.3. IMPACT ASSESSMENT SUMMARIES

9.3.1 Overview

The nature of OT Project impacts is expected to differ across its phases since these phases often involve different types of activity. Like other mining projects, the OT Project will go through four phases: exploration, construction, operations, and closure. During the first phase, the focus is to determine the project’s viability and to plan activities during the remaining phases. During the construction phase, roads and mining facilities are built and machinery and equipment required for operations is purchased and installed. During the operational phase, however, large-scale activities associated with the mining process are undertaken. As the project nears its closure phase, activities will include dismantling and removing buildings, removing all petroleum products, chemicals, explosives, associated wastes and rehabilitating the mine site.

The SIA takes into account whether identified impacts will vary at different phases of the Project’s development. This is specifically considered when the duration of impacts is assessed.

9.3.2 Community concerns

Field-data collection as described in the Methodology tracked two interlinked tasks: (i) to gather data and information that fill existing gaps, and (ii) to understand and document local concerns in order to identify potential impacts of mining operations in the OT Project impact area, in regard to the local economy, social life and livelihoods and environment.

Based on the analysed field data, a matrix was produced to outline major concerns for local communities, together with descriptions of the analysis and potential impacts. The matrix wherein local concerns are analysed and reflected reveals that coalmining operations generate the most worrying negative impacts on three basic components of the SIA: humans, economy and environment.

9.3.3 Analyses of OT potential impacts

The analyses of identified expectations based on local concerns, linked to the mines by locals. Are relatively positive provided adequate, timely and effective measures are taken. The impacts on the local economy and businesses appear to be deeply rooted in the OT Project and other mines’ policies and, on the surface, it is decidedly important for the OT Project to cooperate largely with other mines if the positive impacts are to be maximized.

A matrix on each of the components in the SIA is provided, and its findings are reported individually.

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12 The Economic and Fiscal Impacts of the Oyu Tolgoi Project on Mongolia, The Centre for Spatial Economics Toronto, Canada, April 2005
9.3.3.1 Local economy, local business development and infrastructure

It is evident and anticipated that the OT and other mine projects will invest in upgrading local infrastructure and contribute to soum budget revenues with identifiable inputs, both monetary and in-kind. In addition, various direct and indirect supportive actions are expected to be taken by the mines through local purchase programs and projects.

The matrix presents an outline of local concerns about contributions to be made by the mines to support local government offices and public service institutions, enabling them to improve performing their duties for both the native population and in-migrant mineworkers. These contributions appear to have objectives other than those prioritized by the mines: generating jobs/employment for locals, promoting local public and business sector development.

<table>
<thead>
<tr>
<th>No</th>
<th>Concerns</th>
<th>Analyses</th>
<th>Potential Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Infrastructure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Poor and unreliable supply/availability of energy and water</td>
<td>Lack of permanent supply of electricity and fresh water to soum centres and sub-settlements are key development needs. The Project will increase the number of consumers as well as pressure on existing energy and water infrastructures</td>
<td>Increased pressure on existing infrastructures</td>
</tr>
<tr>
<td>2.</td>
<td>Limited availability of cell-phone services for herders</td>
<td>Since starting the mines’ exploratory phase, locals have experienced previously unknown events, such as increased traffic accidents and unknown occurrences, visitors, etc., and complain that the mine has taken no initiative to extend cell-phone service coverage to make it available to residents in more rural areas</td>
<td>Reduced emotional well-being</td>
</tr>
<tr>
<td>3.</td>
<td>Increased costs for infrastructure maintenance after mine closure</td>
<td>Infrastructure with different capacities and maintenance needs will be built as part of mine development and problems may arise to maintain these infrastructures after mine closure</td>
<td>Increased pressure on local economy during post-project period</td>
</tr>
<tr>
<td></td>
<td>Local business development</td>
<td></td>
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</tr>
<tr>
<td>4.</td>
<td>Increased business competition in limited markets</td>
<td>Although the Project will create some demand for and purchase of local products and services in response to local expectations, it will not provide equal opportunities for all and this may result in insolvency for unviable businesses and service providers</td>
<td>Pressure on viability of local services</td>
</tr>
<tr>
<td>5.</td>
<td>Increased sensitivity and response from local businesses</td>
<td>The Project will offer a range of opportunities for local businesses and services, which may challenge them to be responsive to diversifying and expanding their businesses</td>
<td>Local business growth and diversification</td>
</tr>
<tr>
<td>6.</td>
<td>Limited benefits from large mines</td>
<td>If the mines do not procure products and services from local business suppliers and providers, no benefits from the large mines will be extended to local communities</td>
<td>Reduced emotional well-being, lack of trust and poor response to local expectations</td>
</tr>
<tr>
<td>7.</td>
<td>Destabilized local businesses</td>
<td>Destabilizing local businesses by bringing services from other areas for mines’ interests</td>
<td>Dissolving low viable local businesses</td>
</tr>
<tr>
<td>8.</td>
<td>Improved opportunities for diversified local businesses</td>
<td>The Project will work towards creating a favourable environment to support various local services.</td>
<td>Improved services</td>
</tr>
<tr>
<td>9.</td>
<td>Quantitative and time-bound limitations associated with local</td>
<td>Project will require locally produced major food products and services to be supplied on a constant basis, but the strong seasonality of agricultural</td>
<td>Risks associated with unrealized expectations and reduced emotional</td>
</tr>
<tr>
<td>No</td>
<td>Concerns</td>
<td>Analyses</td>
<td>Potential Impacts</td>
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<tr>
<td></td>
<td>supply vs. mine demands and consumption</td>
<td>production may not be able to keep up with demands</td>
<td>well-being</td>
</tr>
<tr>
<td>10</td>
<td>Local expectations vs. failure to be reliable local suppliers</td>
<td>Due to mines’ highly specific and stringent quality/safety requirements, not all producers will be secured equal opportunities to supply requirements</td>
<td>Risks associated with unrealized expectations and reduced emotional well-being</td>
</tr>
<tr>
<td><strong>Local economic development</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Increased local budget revenues</td>
<td>Increased revenue for soum budgets is a key development need and the Project will contribute to local budget revenue through taxation, fees and donations</td>
<td>Increased budget revenue and stimulated local development</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Poor interpretation by local communities of benefits from improved local budgets will raise high expectations that changes will occur overnight.</td>
<td>Unrealistic expectations</td>
</tr>
<tr>
<td>12</td>
<td>Banks may become more willing to lend against lower collateral requirements</td>
<td>Increased cash savings resulting from improved employment at and income from mines’ purchases will reduce requirements for high collateral lending</td>
<td>Improved access to banking services</td>
</tr>
<tr>
<td>13</td>
<td>Increased savings</td>
<td>Opportunities for increased savings will improve provided there is: 1. Increased employment 2. Increased product sales 3. Increased services’ deliveries</td>
<td>Improved local cash retention and sustained cash flows</td>
</tr>
<tr>
<td>14</td>
<td>Inter-dependence and integration between extended tax base and business expansion</td>
<td>Tax-base expansion is a key issue to improve local budgeting. Development of local businesses in response to positive impacts from mining will expand the tax base as an important source for increased local budget revenues.</td>
<td>Improved budgeting by soum government</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Impacts on tax from diversifying the tax base and expanding local businesses where the mines will have an important and positive role</td>
<td>Improved budgeting by soum government</td>
</tr>
<tr>
<td>15</td>
<td>Existing arrangements for supporting local business development by creating favourable environment are inefficient</td>
<td>Poor commitment by local government to create and maintain a favourable local business development environment may hurt improved public-private partnerships</td>
<td>Unsustainable business development</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Soum government may experience additional pressure on soum public services</td>
<td>Pressure on public services</td>
</tr>
</tbody>
</table>

**9.3.3.2 Population growth and employment**

Concerns and potential impacts on population growth and employment may arise during the various phases of OT Project

<table>
<thead>
<tr>
<th>No</th>
<th>Concerns</th>
<th>Analyses</th>
<th>Potential Impacts</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Migration from other aimags/soums/cities</td>
<td>Associated with expectations of employment creation and development of service industries, it is likely that the OT Project will encourage in-migration by employees (and families) from elsewhere in the country</td>
<td>Increased population growth</td>
</tr>
<tr>
<td>No</td>
<td>Concerns</td>
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<td>Potential Impacts</td>
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<tr>
<td>2</td>
<td>Gender imbalance</td>
<td>The OT Project will create direct and indirect gender-selective employment and, therefore, the gender ratio of populations in the area of direct influence will tend to grow gradually, as a result of increased employment favorable to men</td>
<td>Changed population gender structure</td>
</tr>
<tr>
<td>3</td>
<td>Instability and family breakdowns</td>
<td>Due to OT Project activities, residential patterns will be changed and employment strategies will be modified- particularly among married men. On the other hand, increased direct or indirect male employment, created by the OT Project, may have negative consequences for the wellbeing of married people, as well as on their children, with a potential increase in separated or divorced partners and single parents</td>
<td>Changed family formation and wellbeing</td>
</tr>
</tbody>
</table>
| 4  | Employment opportunities for locals     | - IMMI plans to maximize Mongolian employment levels (achieve a 90% national workforce by the fifth year of operation)  
  - Amongst local communities, it is hoped that it will be possible to provide services and supplies to the mine camps, as a way of generating indirect employment. These expectations range from ambitions to supply meat and milk (for instance starting a new dairy farm), to herders directly selling meat and milk products, in addition to light industries being developed to serve the mine camps (including machinery repairs, etc.) | Increased employment. The greatest expectation by local communities is employment creation, as it relates directly to the high unemployment and poverty rates  
  - Employment will help improve income  
  - Indirect employment. More employment sources and possibilities to work in the mining and service sectors  
  - Gender impact on labour force participation |
| 5  | Skills development training            | - Mongolia’s education levels are comparable to those in many Western countries, with almost universal literacy and high participation rates in tertiary education. However, Mongolians” exposure to the specific technical and trade skills required by the OT operations has been limited  
  - IMMI plans to establish significant training resources and facilities. IMMI is entering a critical phase in regard to setting up training systems and processes. A minimum 3-year timeframe is needed to plan for, train and prepare a workforce for the OT operations | Strong partnerships with learning institutions  
  - Helpful ways to build relationships with local communities  
  - International best-practice standards for students” learning  
  - High-quality job performers |
| 6  | Employment opportunities for expatriates | Initial staffing at OT will include a combination of expatriates and Mongolians. Expatriates will occupy senior management positions. These individuals will be leaders in their fields of expertise and will have hands-on experience from other major mines. Other expatriate personnel, with specific technical expertise, will assist with training and implementing operational procedures during the operation’s early years | Increased employment for expatriates  
  - Skills development for locals. Expatriates will be hired to upgrade the Mongolian workforce’s skills and knowledge levels to |
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<tbody>
<tr>
<td></td>
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<td></td>
<td>enable them to replace most of the initial expatriates</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>● Further depression for disaffected locals</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>● Conflicts between locals and outsiders</td>
</tr>
</tbody>
</table>

### 9.3.3.3 Health and Safety

The OT Project’s implementation will increase population and employee numbers and this will affect access to and the range of health care services. Increased population density caused by the in-migration process will reduce access to health services with health organizations being overloaded and shortages experienced in regard to health facilities, equipment and human resources.

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<th>No</th>
<th>Concerns</th>
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</table>
| 1  | Reduced access to and the range of health care services | Project implementation will increase population centralization in the directly impacted area and health organizations’ will be overloaded. Government needs to change the State health budget distribution based on population growth and it should be more flexible. Increased household incomes may enable some people to establish health organizations as private enterprises to relieve overloaded State health services | ● Worker numbers will be increased  
● Health organizations will be overloaded and it will be expected that the quality of health care services will be improved due to newly-established private hospitals |
| 2  | Epidemiological changes and mortality and morbidity differences among population groups | Incidences of morbidity will increase and causes of morbidity will be expected to change, particularly accidental injuries, circulatory system diseases, and dust-caused respiratory diseases will increase | Communicable and non-communicable diseases will be increased, particularly, accidental injuries, respiratory diseases and circulatory system diseases |
| 3  | RH access and FP services and their quality | Due to increased population centralization and in-migration, the incidence of STIs/HIV/AIDS, as well as infertility and abortions will increase  
The quality of RH/FP access and services may decline | Incidence of STIs/HIV/AIDS, infertility and abortions will increase in the directly and indirectly influenced areas |
| 4  | Living environment changes pertinent to health issues | The availability and quality of drinking water in areas of direct and indirect influence will decline, due to increased vehicle movements, reduced drinking water, noise, and emissions, Dust and air pollution will be major problems for OT and other mining operations, as these will reduce living and environmental conditions quality in directly and indirectly influenced areas | Living and environmental conditions quality in the directly, indirectly and cumulatively influenced areas |
| 5  | Impacts on food safety and food supplies | Due to population centralization, food demands will increase. However, as laboratory inspections for food products are inadequate and there are no proper | Food supplies and the quality of food consumed will decline |
1. **Concerns**

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<tr>
<th>No</th>
<th>Concerns</th>
<th>Analyses</th>
<th>Potential Impacts</th>
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<tbody>
<tr>
<td>1</td>
<td>Need for more facilities, services and infrastructure at kindergartens and schools (and dormitories)</td>
<td>During recent years, kindergartens’ and secondary schools’ capacities have been exceeded due to immigrant families (with children) to Umnugovi aimag in order to work at the OT or TT mining sites. Accordingly, future first grade enrollment will be increased. When the OT mine starts, the kindergartens’ and schools’ capacities will not meet demands. Where young couples work at these mining sites, more under 6-year-old children will attend kindergartens. Pupils needing to live in dormitories will also increase when the OT mine starts. The lack of educational equipment, books, libraries, laboratories and other course materials, at schools, and the lack of toys at kindergartens, were identified as key development needs.</td>
<td>Pressure on facilities, services and infrastructure at kindergartens and schools (and at dormitories).</td>
</tr>
<tr>
<td>2</td>
<td>Need for more professionals with higher education</td>
<td>The following results were identified by the Baseline Survey on Community Perceptions. Secondary school students/young people would like to attend professional mining orientation and training in order to be hired at the OT/TT Projects. The Vocational and Professional Training Center also needs to be expanded by including professional mining classes. The OT Project is implementing an educational program for students, according to which students from poor households have had more opportunities to study at universities and receive higher education.</td>
<td>Expanded skills base: increased population with professional education.</td>
</tr>
<tr>
<td>3</td>
<td>Indirect impact on school drop-out</td>
<td>Many people from herder households want to work at the OT Project, with a risk that children aged 6-15 may drop out of school to take care of livestock when their parents work at the OT Project. OT is planning a</td>
<td>School drop-out impact.</td>
</tr>
<tr>
<td>No</td>
<td>Concerns</td>
<td>Analyses</td>
<td>Potential Impacts</td>
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</table>
| 4  | Local business support program  
• In-migrant workers’ children aged 6-15 may drop out due to their parents’ carelessness  
• Where parents do not attend to their children’s school registration while transferring from one school to another, the old school’s registration for that child is seen as a school drop-out | Professional teachers are few at Umnugovi aimag schools and some teachers teach more than one subject, including non-professional subjects – identified as a key development need.  
• Some teachers at secondary schools in Umnugovi aimag want to work at the OT Project to earn higher salaries  
• This creates opportunities to increase numbers of teachers by increasing fundraising at educational institutions funded according to variable consumption-per-child requirements by increasing the number of children at schools and kindergartens. Conversely, for schools with a reduced number of children, their budgets and funding will be decreased, thus raising the more challenging issue of whether or not these schools should continue to exist |

| 9.3.3.5 Cultural heritage |

The locals believe that the Gobi is rich in cultural and historical heritage. It is believed that the local cultural and historically significant heritage may be affected by various factors such as in-migration, illegal excavation and losses of traditional cultural and customary responses and attitudes.

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<th>Concerns</th>
<th>Analyses</th>
<th>Potential Impacts</th>
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</thead>
</table>
| 1. | Increased illegal excavation and disturbance of significant paleontological and archeological objects and sites | ● The Project will cause employment, in-migration and population growth in its direct and indirect impact areas  
● Illegal excavation and excavation of archaeological burial and paleontological sites for profiteering may increase | Loss of archeological and paleontological objects |
| 2. | Changed local traditional customs | ● The Project will generate employment for in-migrants from other parts of Mongolia and may disrupt the proper conduct of worship rituals at local cairns (ovoos), taboos and customs  
● According to population growth and representations of different regional cultures, local routines, customs and rituals may change and weaken  
● The Project will generate non-traditional or non-herding employment which, in turn, may change lifestyles and customs  
● Socio-economic changes in the Project area will impact households’ emotional well-being, including their sense of ownership, place and membership | ● Reduced local cultural identity and emotional well-being  
● Weakened local cultural identity  
● Weakened traditional way of life and social fabric |
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<th>No</th>
<th>Concerns</th>
<th>Analyses</th>
<th>Potential Impacts</th>
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</table>
| 3. | Better conditions to preserve and protect cultural heritages | ● The Project may support various cultural projects to recover objects, such as monasteries and stupas destroyed during the socialist regime and to restore worshipping objects ovoos (cairns), etc.  
     ● The Project may provide better preservation and protection management for cultural heritages in direct and indirect impact areas | ● Contribution to local identity  
     ● Local authorities and communities will accept certain monitoring duties due to their expectations |
| 5. | Increased religious institutions                 | Due to population growth, other religious institutions may be established in this region | Generate some social threats due to different religious activities |
| 6. | Loss of and changes to local cultural identity   | The main factors to change traditional culture are globalization and new job opportunities. | Weaken local cultural identity |

### 9.3.3.6 Land resources and local pastoral patterns

The main natural resources in the either OT Project impact area that have undergone or are being subjected to effects from various mine-related impacts include:

- Land
- Pasture
- Potable human and animal water sources
- Grazing land vegetation

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<tr>
<th>No</th>
<th>Concerns</th>
<th>Analysis</th>
<th>Potential Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Unplanned land tenure arrangements and repeated land take</td>
<td>In Khanbogd and Tsogtitsetii soums where more in-migration of people occurs, management issues for land tenure have been problematic.</td>
<td>Pressure on land resources</td>
</tr>
<tr>
<td>2</td>
<td>Pastureland take</td>
<td>The taking of pastureland already experienced will continue as more infrastructure and other mine-related immobile facilities are built</td>
<td>Increased pressure on pasture and water during all seasons</td>
</tr>
<tr>
<td>3</td>
<td>Pastureland destruction and degradation</td>
<td>Large grazing areas already irreversibly destroyed and/or degraded due to poor quality mine-built earth roads, uncontrolled traffic, unauthorized road diversions associated with large-scale quarrying and the lack of proper land rehabilitation</td>
<td>Long-term ecological risks</td>
</tr>
<tr>
<td>4</td>
<td>Dust polluted pasture vegetation</td>
<td>Heavy trucks (over 600 by mid-2009) generate dust that disperses over large areas on both sides of the road, polluting vegetation and threatening wild fauna</td>
<td>Local fauna and flora biodiversity risks</td>
</tr>
<tr>
<td>6</td>
<td>Depleting water table in wells herders use</td>
<td>Consumption of unsustainable quantities of underground water by mines will lead to a steady and imperceptible depletion of the table for both shallow and deep underground water aquifers</td>
<td>Irreversible humanitarian and ecological crisis</td>
</tr>
<tr>
<td>7</td>
<td>Health of domestic stock and wildlife</td>
<td>Dust will cause temporary and long-term illnesses for respiratory, optic and digestive systems among both domestic and wild animals</td>
<td>Community and wild fauna health risks</td>
</tr>
<tr>
<td>8</td>
<td>Traditionally used pasture and water sources may be cut off from the other parts</td>
<td>The railway may separate main camps from vital sources for pastoral herding such as pasture and wells</td>
<td>Unequal access to and pressure on natural resources</td>
</tr>
<tr>
<td>9</td>
<td>Changed seasonal pastoral migration routes</td>
<td>The railway crosses seasonal pasture, dividing into heavily used and underused areas, and water points may fall on the alternative side of the railway making</td>
<td>Increased inequality to access and use traditional grazing</td>
</tr>
<tr>
<td>No</td>
<td>Concerns</td>
<td>Analysis</td>
<td>Potential Impacts</td>
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</tr>
<tr>
<td>10</td>
<td>Reduced mobility of herders</td>
<td>Cutting traditional or legally-allocated pasture from other parts may impact on seasonal grazing mobility for herders</td>
<td>Pressure on grazing resources and degradation of pasture</td>
</tr>
<tr>
<td>11</td>
<td>Land rights for businesses and other activities linked to land may be threatened</td>
<td>Land taken for infrastructure and other mine-related constructions may result in raising conflicts in regard to local citizens’ struggles for the rights to use, possess and own land</td>
<td>Pressure on decision-making at local levels</td>
</tr>
<tr>
<td>12</td>
<td>Sensitive and unwelcoming attitudes to allocation of land and grazing areas to resettled indigenous and in-migrant households</td>
<td>Land taken for mine operations and the arrival of new families as mineworkers and job seekers will reduce the size of land for urban settlement and pastoral grazing</td>
<td>Pressure on local government in regard to land allocation and grazing resources</td>
</tr>
<tr>
<td>13</td>
<td>Physical and chemical pollution of water sources caused by sedimentary dust and various chemicals and oils</td>
<td>Dust and other pollutants, spills/leaks of fuel and other hazardous materials and rubbish left by trucks and truck drivers may lead to cumulative impacts - chronic pollution of water sources and wells in particular</td>
<td>Increased environmental and health risks</td>
</tr>
</tbody>
</table>

### 9.3.3.7 Social and economic aspects of environmental aspects

There has been undertaken a full environmental impact assessment survey, where the key impacts of OT mining on the local environment are discussed. However, the main socio-economic aspects of environmental impacts remain poorly touched. In this regard, the concerns of local stakeholders were investigated to draw some principally important aspects of the environmental impacts caused by direct and indirect factors.

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<thead>
<tr>
<th>No</th>
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<th>Analysis</th>
<th>Potential Impacts</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Dust generation and dust spreading</td>
<td>Mining activities and traffic will generate dust, which will affect the environment along the coal transport route from Tavan Tolgoi coalmine to Gashuun Sukhait border point and road from Oyu Tolgoi to Gashuun Sukhait border point.</td>
<td>Environmental health risks</td>
</tr>
<tr>
<td>2</td>
<td>Noise from trucks</td>
<td>Mining-related activities and railway will generate noise. Noise emissions from vehicles/construction/operation and blasting will affect the amenity of residents near the routes and sites and wildlife.</td>
<td>Environmental health risks</td>
</tr>
</tbody>
</table>

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13 *EIA 2004 of Oyu Tolgoi-Gashuun Sukhait road and adjacent infrastructure*

*EIA 2005 of the project on use by Oyu Tolgoi of underground water resources in Galblyn Gobi and Guntii Khooloi

*EIA of the Oyu Tolgoi water supply pipeline project*

*EIA 2007 of the copper and gold mining and processing project at the Oyu Tolgoi deposit*

*EIA of the coal-fired power plant*

*EIA 2007 of the project on moving the location of the local airport*

*Report on revised and amended infrastructure assessment*
### 4. Soil damage and degradation

Soil degradation caused by frequent trucks and diverting main coal forwarding roads and making unsanctioned tracks near soum centre and mine sites. Trucks directly damage fragile and lightly textured soils in the Gobi.

**Irreversible soil and wild flora degradation**

### 5. Water resources and water availability

According to local people perception and the OT EIA, the following potential impact may occur:
- The groundwater resource in the Gunii Khooloi may diminish
- The groundwater level in the Gunii Khooloi aquifer may decrease
- Springs, streams and the Umdai river and ponds in its basin may dry up

**Environmental degradation**

### 5. Wildlife migration

Wildlife migrated because of noise emissions and pollution/contamination of their habitat areas

**Wildlife biodiversity risks**

### 6. Mine closing

Some parts of open pits and roads may left unrehabilitated or incomplete

**Environmental degradation**

### 7. Visual impacts

Natural ecosystems will be changed during construction and operation and rehabilitation

**Changes in the local natural ecosystems**

### 9. Strictly Protected Area

The natural compound and essential environmental elements of the Gobi Baga Strictly Protected Area will be affected by dust and noise emissions and degradation of the surrounding areas

**Wildlife migrates out of their habitat areas**

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### 9.3.3.8 Government services, safety/crime infiltration and resettlement

As the success of OT Project and other mine projects operating in the OT Project impact area will depend largely on local stakeholders’ performance including the soum authorities and the community, the SIA looked at a few key aspects of local services deliverable by soum governments, as well as partnership contributions by resident stakeholders, to cooperate with the mines for effective impact management.

<table>
<thead>
<tr>
<th>No</th>
<th>Concerns</th>
<th>Analysis</th>
<th>Potential impacts</th>
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<tbody>
<tr>
<td>Local government service and participation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Role of and participation by local citizens, entities and other stakeholders in environmental protection and effective environmental monitoring</td>
<td>Although people in the survey areas always talk and complain about increased environmental damages and deterioration, no participatory approach is in place to handle this issue</td>
<td>Poor involvement by local stakeholders in good governance</td>
</tr>
<tr>
<td>2.</td>
<td>Poor local commitment for effective environmental protection and environmental monitoring</td>
<td>Local commitment, key initiatives and actions to maintain and rehabilitate the environment remains low</td>
<td>Poor involvement by local stakeholders in good governance</td>
</tr>
<tr>
<td>3.</td>
<td>Burdens to manage normal functioning soum public services</td>
<td>Increased out-migration by citizens and schoolchildren from some soums, for example Manlai and Bayan-Ovoo, may result in budget cuts during</td>
<td>Pressure on services</td>
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<tr>
<td>No.</td>
<td>Concerns</td>
<td>Analysis</td>
<td>Potential impacts</td>
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<tr>
<td>4.</td>
<td>Increased crimes and violations</td>
<td>The mines will generate employment for many workers including ill-behaved and antisocial individuals</td>
<td>Reduced safety and emotional well-being</td>
</tr>
<tr>
<td>5.</td>
<td>Increased alcoholism</td>
<td>Disposable income earned by employees may be spent in socially undesirable ways, for example drinking which, in turn, may encourage alcoholism</td>
<td>Reduced emotional well-being</td>
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<tr>
<td>6.</td>
<td>Increased gambling</td>
<td>The mines will generate employment and encourage economic activity leading to higher spending which, in turn, may encourage various social ills, including gambling</td>
<td>Reduced emotional well-being</td>
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**Crime Induction and Safety**

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<tr>
<th>No.</th>
<th>Concerns</th>
<th>Analysis</th>
<th>Potential impacts</th>
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<tbody>
<tr>
<td>7.</td>
<td>Give up herding as a dilemma</td>
<td>The mines will create jobs, which herders may take. Inherently, herding and part-time jobs are not well matched and, to engage in permanent jobs, herders may be forced to give up herding. Employment at mines may thus make herders face a difficult choice between either herding or working for mines</td>
<td>Reduced human resources for herding</td>
</tr>
<tr>
<td>8.</td>
<td>Diluted commitment and opportunity for those giving up herding</td>
<td>Although hiring local people, including herders (whoever satisfies requirements) would be the mines’ key employment policy, this touches on the most fragile issues of livestock production and rural livelihoods – returning to herding after leaving the mines becomes an alternative</td>
<td>Reduced emotional well-being</td>
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<tr>
<td>9.</td>
<td>No herder households will voluntarily resettle</td>
<td>Local people expect the mines to take responsibility, whatever the causes are, for resettlement or displacement</td>
<td>Disappointed expectations</td>
</tr>
<tr>
<td>10.</td>
<td>False claims for resettlement</td>
<td>Local people and pastoralists complain that dust and other adverse impacts have been unacceptably high for them to stay at their current locations but in this regard, some false claims may arise</td>
<td>Community relations difficulties</td>
</tr>
<tr>
<td>11.</td>
<td>Resettlement or dislocation may overburden those affected</td>
<td>Locals believe that unforeseen resettlement and relocation will continue, as building the railway was never envisaged and that in such unpredictable circumstances, moving properties and belongings will require additional resources from owners during and after resettlement</td>
<td>Additional burdens and reduced emotional well-being</td>
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</table>

The locals have enquired about the mines’ plans to handle increased mine traffic and other incidents, as well as offensive behaviour by mineworkers. Participants at FGDs in the target soums suggest that residents do not appear to be overly concerned about misdeeds at the mine camps and other mine-operated settlements, and that most of their concerns are about the possible infiltration of crime and violations from locals to mines and vice versa. If this concern is taken as a cause that may lead to undesirable impacts, active and purposeful involvement by all sides to decide on its management will be essential.

The matrix also reflects discussion on concerns raised by local communities in respect of resettlement and relocation. This issue has been extensively discussed among the locals since the complete failure of coal miners to keep truck roads well maintained and Ukhaa Khudag’s
announced railway plan, with a negative expectation being raised that some of these locals will be resettled or relocated.

9.4 DISCUSSION OF POTENTIAL IMPACTS

This section is laid out in the following way:

**Stakeholder Concerns.** The concerns expressed by stakeholders about potential project impacts are listed and described at the commencement of each impact area.

**Potential Impacts.** There then follows a detailed discussion of the aspects of each identified impact, which includes not only stakeholder input but also the results of field and documentary research undertaken by the study team.

**Management.** Potential means of managing the impacts are then discussed. These are the result of deliberation by the Research Team but also take into account suggestions from stakeholders.

**Residual Impacts.** Then, if relevant, residual impacts, those that will persist even after management and mitigation measures are undertaken, are discussed.

**Impact Groups.** The impacts have been grouped together under the following headings:
- Local economic and business development
- Population growth
- Employment
- Education
- Health & Safety
- Cultural heritage
- Environmental aspects of socio-economic impacts
- Natural resources and local agricultural capacities
- Government services, safety/crime infiltration and resettlement

9.4.1 Local economy, local business development and infrastructure

9.4.1.1 Local business development

The locals perceive that the OT Project will have impacts that would affect local business development in both negative and positive ways throughout its implementation. Such impacts in the line of local stakeholder concerns can be summarized as follows:

**Concern #1: Competition for the limited market will improve sensitivity and capability of the local business to respond to market changes**- The mining activities will create various demands and markets in direct and indirect ways, thus, increasing sales. This market will attract many local and foreign businesses. However, despite the size of the mine and increase in the population, the demand will nevertheless be limited, which inevitably will lead to competition among the business operators. In the process of such competition for a highly concentrated market in a unique and limited area in terms of demand and consumption, those with weaker capabilities will go bankrupt or close. Many local businesses with a weaker
economic capacity, used to operate in conditions of low competition, may be affected by these circumstances and, in such a situation, the local residents and the local economy may suffer substantial damage.

Concern #2: Revenues and profits of local businesses would be highly dependent on how the OT and other mines behave - The OT mine plans to locally procure goods and services and involve the local businesses in its procurement and supply activities, which would be one of the positive impacts on the economy of the soums in the OT Project impact area. However, certain risks may potentially occur such as extreme dependency of local businesses on the mine creating a threat to the sustainability of local businesses. All business owners cannot equally participate in the mine’s local purchase activities. As a result, small businesses that have weak competitive abilities, for instance, small shops and service providers that are not engaged in sustainable business connected with the mine may become unsustainable. If the mine decides to pursue its own interests and refuses to procure goods and services from local businesses and to cooperate with local businesses, then, the mining projects will have little or no benefits for the local community.

Concern #3: Local businesses’ ability to protect their local market will increase - The OT Project, accompanying infrastructure facilities and population centres represent the main market for the soums in the project area. The main objective of the local businesses is to capture this market. However, this market can not be protected by administrative methods. Therefore, the local residents believe that, by receiving support from the mine, the local businesses will become reliable partners providing a sustainable supply of goods and services, thus, improving their ability to protect the local market.

POTENTIAL IMPACTS

Increased business competition and increased burden on local business have positive and negative sides. On one hand, some business owners will be driven out of the market and go bankrupt; however, on the other hand, the competitiveness and the financial capability of local businesses will improve. It is very likely that such business competition will emerge in all soums of the project area throughout the duration of the mining operation.

An indirect negative impact of the mine on the local community is increased direct dependency of local businesses on the mine and, although the probability of occurrence of such impacts is not that high, nevertheless, such impacts would be strong in the case of occurrence. Such negative impacts will primarily occur in the centers of the soums in the project area at all stages of the mine’s operation. These impacts may show up in the following ways:

1. Local small businesses shut down or change their activities or go bankrupt.
2. Businesses fail to react to market changes.
3. Expectations of ready solutions.
4. Overvaluation of the importance of the mine.

Increased ability of local businesses to protect their market is a direct positive impact on business owners of the project’s impact zone. Such impact may occur at all stages of the mine’s operation; however, the probability of its occurrence is medium, and, in the case of occurrence, its positive benefits will not be clearly noticeable in business activities.
A special program to support the local businesses and protect them from foreign competition may be developed and implemented. Such programs could include such measures as signing contracts for procurement of goods and services for the mine specifically with local suppliers, providing soft loans or advances for business start-ups and expansions, organizing training on capacity improvement.

In addition to the mine, the local government should play a significant role in protecting the local business from competition. The local government could provide to local businesses direct and indirect financial support, improve infrastructure, create favourable workplace and land conditions and provide business licenses.

Along with supporting the local businesses by giving them advantages, the mine should also leave the possibilities open for other business owners to enter the market. Encouraging competition in such way will have a positive impact by improving the quality of goods and services, promoting local business development and increasing competitiveness. Although the investment and cooperation agreements include obligations to give priority to local business development and the mine is to work hard to implement them, a transparent quality system should be introduced to monitor the quality of procured goods and services and sustainable business groups should be formed in the region to build a long-term partnership, thus, ensuring conditions for procurement of high quality goods and services.

At the initial stage of the project, certain measures can be implemented in the form of assistance and support, but without overdoing it, in order to ensure the sustainability of local small businesses. In the future, continuing such measures will not be beneficial for each party, as businesses must learn to stand independently of the mine.

The local government at all its levels should provide assistance to mitigate negative impacts by conducting activities aimed at developing cooperation and partnerships between local businesses, providing intermediation in building a sustainable partnership with the mining business and involving them in training and promotional activities.

There will be little that can be done by the mine as the market protection is the duty of the businesses and the local government. However, the mine will have to fulfill its obligations under the agreements concluded with local businesses and to have high requirements.

The local businesses should coordinate their activities with the local government, exchange information, switch to more sustainable and more profitable forms of cooperation, improve the quality of goods and services and expand the scope of services.

**9.4.1.2 Local economic development**

The impacts of the OT Project on the local economic development can be classified into two categories as follows:

1. Impacts through revenues to the local budget, and
2. Impacts through the local financial market
STAKEHOLDER CONCERNS

Concern #1: Local budget revenue will increase - It is inevitable that, according to Mongolian laws, the revenues of the aimag and soum budgets will increase with the beginning of the OT Project. Therefore, the perceptions and expectations of the local residents are well grounded.

Concern #2: Public service and infrastructure will improve - As a result of increased revenues to the aimag and soum budgets, the municipality will have a larger opportunity to invest in the expansion and improvement of public services, assistance to businesses and development of infrastructure. Therefore, increased revenues will ensure that the expectations of people regarding improved public service, supply and infrastructure should be met.

Concern #3: Savings increased, banks willing to accept lower collateral - As the number of people employed at the mine and receiving high salaries increases and the businesses supporting the mine develop, the cash outflows from the region will decrease, savings will increase, commercial banks should soften their collateral requirements and increase lending, all of which will be a positive impact on the local financial market.

Concern #4: Support to local business and creation of an environment conducive to business development is not sufficient - It is quite probable that the public-private partnership arrangement and government regulation will weaken and the public services provided by the Governor’s Offices of the soums will be faced with an additional load and will not be able to reach every entity when the number of business entities, organizations and individuals in the region proliferates and the scope of their activities expands further.

POTENTIAL IMPACTS

The budget revenue growth is an impact that has a substantial nationwide implication, not limited just to the local area. According to preliminary estimates, the budget revenue of Mongolia will increase by 1/3 as a result of the OT Project implementation\(^\text{14}\). In addition, the budgets of the aimag and soums implementing the project will substantially increase. Increased revenues of the local budget, improved infrastructure and improved public service will be a direct positive impact on the municipality that will have an effect at all stages of the mine’s operation. However, the effects will significantly increase at the mining stage.

In accordance with the General Taxation Law of Mongolia and the Draft Investment Agreement, dated of March-April 2009 the following taxes and fees will be paid to the centralized budget of Mongolia. These data are extremely subject to changes. The talks between the Mongolian Government and IMMI/PT, which are underway when this report was completed, are expected to come to a number of consensuses on the following.

- Corporate income tax at 10% on the annual taxable income of Tg 0-3 billion and, if the taxable income exceeds Tg 3.0 billion, at 25% on the portion exceeding Tg 3.0 billion;
- Royalty payment, interest payment of financial leases, administrative expenses payment, management payment and rent at 20%

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\(^{14}\) The Economic and Fiscal Impacts of the Oyu Tolgoi Project on Mongolia: Phase 2, Prepared for Ivanhoe Mines by Ernie Stokes, The Centre for Spatial Economics, Toronto, Canada, September 2005
- VAT at 20% on the income earned from the goods and services sold on the territory of Mongolia;
- Customs duty
- Excise tax
- Gasoline, diesel fuel tax
- Payment for use of mineral resources at 5% on the value of the sales
- License fee for mineral exploration and mining licenses

The following revenues will be paid to the local budget, namely to aimag:
- Personal income tax;
- Land use payment: US$ 15 per hectare of the area granted by the mining license
- Immovable property tax
- Stamp fee
- Water use fee
- Motor vehicle tax

Improvement of the local financial market, increased lending and lesser requirements on collateral are all a combined direct positive impact and such impact will occur in all soums in the project area at each stage of development and mining. The positive impact will be the strongest at the mining stage when the number of employees will substantially increase. Such impact will be visible through the activities of commercial banks; therefore, there may still be a long time before this change is felt.

The soum government is not doing a satisfactory work on creating an environment conducive to business development and providing support to local businesses. In the future, the load on the government service will increase, thus, sustainable business development and active partnership may be undermined. This will undoubtedly be a negative impact on the local economic development. Such an impact may occur in the soums where the population of the project area is settled and concentrated. This impact may be the most visible at the initial stage of the activities and will decrease as the public services stabilize.

MANAGEMENT

An important key issue for the local development is to increase the revenues of the local budget. Therefore, the local government of any aimag or soum is interested in increasing the budget revenues that are in their authority of spending. However, the revenues paid by the mine to the local budget are regulated by the laws of Mongolia and the investment agreement between the Mongolian Government and the OT Project and, therefore, there is very little that the project implementor can do to increase the revenues of the local budget through the taxes and fees established by law. However, the mining projects can make an appropriate contribution to increase local budget revenue through investments in joint activities or donations for improvement of jointly used infrastructure facilities according to the cooperation agreements signed with the municipality.

Right management is needed from the national and aimag governments in order to ensure an appropriate distribution and use of the revenues paid to them by the mine to the local budgets.
The bulk of revenues paid by the OT Project will be paid to the central government, which may even reduce its contribution to the aimag and soum governments on the grounds that they will be receiving increased local tax revenues from OT. There may be a need for collaborative lobbying to the central government by the aimag and soum governments with assistance from OT and other major projects in the area, for an increased revenue allocation to the mining area governments from central coffer.

The tax revenues paid by the OT Project to the soum budget are paid directly to the budget of the Khanbogd soum with a certain proportion being transmitted to the aimag government. The authority of the soum government should be enhanced so that it also has a say on the distribution of the revenues paid to the aimag budget between the soums and between the items of the budget expenditures. The Khanbogd soum enjoys an advantage in terms of the redistribution of the revenues between the soums of the project area and in terms of the share attributable from the regional budget revenue. This may seem unfair to the other Project area soums, so there may be a need to ensure an equitable distribution among the soums according to need and degree of impacts caused by the OT Project. In this connection, the budget and tax laws and especially the Public Sector Management and Finance Law should be amended.

Due to their insufficient understanding and knowledge regarding the budget revenue increase and the benefits of such an increase, people tend to have an expectation that everything will change immediately. The local residents in the soums located in the project area expect that their salaries, pensions, benefits etc will immediately increase and the public service will radically improve as soon as the mine starts mining operations. However, such changes will be regulated at the national level according to the centralized procedure, as specified in the laws of Mongolia; therefore, such changes will not immediately reach the local community and tensions may build among the local residents as their expectations are frustrated. Therefore, in this connection, the legal coordination must be done in a prompt and efficient way in line with the changes in circumstances. However, the governments of the soums are used to functioning under a very tight budget and may have little experience with using in a proper way the contributions made by the mining project to the local budget. Therefore, there may be a need to improve the capacities of the local government. Furthermore, due to the lack of transparency and shortage of skills of the local governments, the local residents may start to distrust and express various suspicions that the taxes and donations paid by the mine to the soum budget are inappropriately used. Therefore, providing the citizens with an understanding of budget revenues and expenditures and their use and making the budget appropriations and expenditures transparent will be regarded as a high priority.

The main form of the OT Project impact on the local financial market will be attracting and retaining in the area a large number of people by providing them with jobs and paying them a decent salary. The company’s policy will be to increase the number of employees when the mine goes from the development stage into its mining stage and to increase the share of Mongolian nationals in the total number of employees. In order to support local businesses and citizens, the investors will give priority and advantages to local legal entities and individuals when procuring goods and services. Furthermore, special programs can be designed and implemented in order to assist the local businesses and individuals in improving their capabilities and in starting and expanding their activities to supply goods and provide services to the OT project.
RESIDUAL IMPACTS

Although it is clear that the project will have a substantial impact on the local budget, nevertheless, it is difficult to quantify today the size of such impact. This will depend on the following several factors.

1. The sales of the products produced by the OT Project will be volatile depending on the world market demand for metals. Therefore, there is a risk that the production volume and the revenue will be unsustainable because of such volatility.

2. The activities of the OT Project have a fairly long lifespan. During this period, various amendments may be made to the investment agreement and such amendments can not be predicted.

3. Similarly, various amendments may be made to the Mongolian laws governing such relations as the funding and appropriation of the national and local budget, the administrative division and the issues related to the expenditures of the budget such as the government social and investment policy and such amendments can not be predicted.

There is a risk that the revenue of the local budget will plunge when the mine closes. Therefore, certain items of the budget expenditures that existed when the mine was operating and the local budget was “rich” can no longer be financed after the mine closes. Thus, during the time when substantial revenues come from the mine to the budget, a major focus must be made on working together with the mine towards increasing the investment for development of such businesses and business activities that will not be dependent on the mine.

9.4.1.3 Issues related to infrastructure development

Concern #1: Availability and supply of energy and water is poor and unreliable. There are not reliable sources that supply the soum center and other settlements with energy and water and the residents who live in the OT Project area are extremely concerned about the uncertainty that such sources will emerge in the future. Improvement of energy supply, water supply, road and transport conditions are regarded as the key issues for local development and, without increasing the capacity in these areas, there is very little future for development of business and improvement of people’s standard of living in the countryside. It is perceived that, in the future, the mining project will increase further the number of consumers and providing for consumption needs with the existing supply of energy and water will not be possible.

Concern #2: Energy, water and communication services have a limited scope of coverage. Despite further expansion of the scope of coverage of mobile phone services throughout the country, such services still stay limited to the soums located in the project area. Plans have been made on delivering energy and water to urban areas where the population is concentrated; however, the rural population, including herders, will still have little access and availability. Since the beginning of the exploration stage of the mining project, the residents have been faced with issues that did not exist before such as increased motor traffic, increased accidents, the incidence of various crimes and the appearance of unknown people. Considering that the need for urgent communication gradually increases in connection with this, people feel that the mine ought to pay attention to such measures as delivering mobile phone services to the areas where herders and rural residents mainly camp.
Concern #3: Maintaining infrastructure operations will require more costs after the mine closure. Various infrastructure facilities differing by capacity and maintenance requirements will, probably, appear in connection with the mining operations. Especially, mine-related infrastructures tend to have high capacities and large dimensions and occupy a significant territory. The local government and residents of the project area fear that the municipality may face an unbearable burden when some of these infrastructure facilities will not be used at all after the closing of the mine or when there will be difficulties such as large expenses for maintaining the regular operation of some of them.

POTENTIAL IMPACTS

Increased load of the existing infrastructure facilities, reduced access and unavailability of services for some of the population of the soums located in the project area, appearance of infrastructure facilities that will have no use or limited use after the closing of the mine and that may burden the local economy are all direct negative impacts. The load on the existing infrastructure facilities will increase at the inception stage of the project and during the first stage of development while the pressures and burdens on the local economy related to the use and maintenance of the new infrastructure facilities will emerge only after the closing of the mine.

Since the existing local sources will not be able to meet the energy, water, road and transport needs of the mine at the current development and mining stages, it is inevitable that new infrastructure facilities will be designed and built for the operations of the mine. Many things will depend on how the infrastructure built in these conditions will be used for local business and industrial purposes and on how this arrangement is going to be organized.

The current perception of the local residents focuses only on such infrastructure issues as motor roads as well as the facilities for supply and distribution of electricity, communication and water. However, there is also a great need for taking such inevitable measures as increasing the capacity of the local government buildings and public services centers, ensuring the proper planning and design of urban areas in line with the growth of the population and its consumption needs, and allowing public use of the airport and railway. The OT Project will have to make an appropriate contribution to resolving these issues faced by the local government.

The following are thejustifications for the participation of the mine in the development of the local infrastructure.

1. As a result of the OT impacts, the population of the soums covered by the project area will increase and the existing infrastructure designed for a small population will not be able to cope with the increased load.

2. The local development must reach a higher level under the influence of globalization and urbanization and large enterprises conducting their activities in the region must make an appropriate contribution.

3. The mine should fulfill the obligations to develop infrastructure and allow its use by the municipality that are specified in the investment agreement signed with the Government.
MANAGEMENT

Joint management involving the two main parties such the national, aimag and local governments on one hand and the mine on the other hand as well as several other participants will play an important role for resolving the issues related to the local infrastructure.

The Government of Mongolia must not only include in the investment agreement and require and monitor the implementation of such issues as the development of the local infrastructure and permission for the municipality to use the infrastructure facilities designed for the mine’s operations, but take also actions to create in the project area soums the infrastructure required for social development or to expand the existing facilities without imposing all responsibility on the mine. Such actions that will be implemented by the central and aimag governments must be reflected in the short- and long-term social development national and aimag plans.

In order to implement joint activities on the infrastructure by the national Government and the mine, an important organizational measure could be signing an agreement governing the relations between the Government of Mongolia and the OT Project. Participation of local community and key stakeholders both in the implementation of actions and measures on managing socio-economic and environmental impacts ensured through joint initiatives would be the key mechanisms that the draft IA envisages. In this agreement, the investor might undertake an obligation to provide certain infrastructure created for the mining purpose for use to the local municipality and residents for everyday needs, on business conditions or as assistance if such use does cause impediments to the project activities.

In order to regulate the relations between the OT Project, Umnugovi aimag and the soums in the project area, a cooperation agreement could be signed with the local government exploring ways in which the use of the mining infrastructure for everyday or business purposes might be possible. Such agreements could be an important regulatory mechanism to meet the public expectations that the local infrastructure will develop by the mining impact; however, they must not impede the mining activities.

Such large infrastructure facilities as the railroad, paved road and power plant should be resolved by joint investments and on the condition of joint use by Tavan Tolgoi and other companies owning the mineral deposits located in the proximity to it. In order to represent the national and local interests, one option could be to sign a cooperation agreement and participate in the investment.

The local governments should as well take an obligation to expand the necessary infrastructure or to develop new facilities based on their internal possibilities. Increased local budget revenues because of the mine will be a substantial contribution to the fulfillment of such obligations. In other words, the local governments will have an improved financial ability to invest in the required local infrastructure. The mid-term strategic plans outlining the development of local soums over the period of 5-10 years should include also the infrastructure issues in connection with the mine.
RESIDUAL IMPACTS

It is difficult to predict today the implementation process and the different forms that the local infrastructure could take after 40-50, maybe even a hundred years from now. Some infrastructure projects will independently develop by themselves without involvements of the mine and the municipality. For instance, it is very probable that mobile phone and internet services will develop without anybody’s involvement just by the business rule following the population growth.

It may also well be the case that the matters related to the use of infrastructure created by joint investments of a number of companies by the municipality as well as for other business purposes will become an issue involving several parties, maybe an international issue. Maybe this region will become an area with a large concentration of the population and comparative advantages in the living conditions and we can not deny the fact that then foreign, national and local businesses will start to invest in the profitable infrastructure sectors. In addition, international organizations may provide assistance and support to the infrastructure sector.

9.4.1.4 Local agricultural production and service capacities

Issues related to land-rights and land-use arrangements at soums in the OT Project impact area and recognized as concerns by the locals, are as follows:

   Concern #1: Discontentment in regard to local supplies of agricultural products vs. mine demands and consumption patterns – The mines’ present local purchase policy is unclear but has raised local expectations to supply home-produced products.

   Concern #2: Continued failure to become mine suppliers – The purchase of local home products will promote competition between sellers with many being unable to meet requirements.

POTENTIAL IMPACTS

The Umnugovi aimag social, economic and environmental baseline survey (USEBS) suggests that there are great expectations among all agricultural producers to sell their products to the mines. It simply means that the mines will face huge pressure to purchase locally-produced items from herders/livestock keepers and crop growers.

In relation to the potential impacts of the mines in terms of purchasing local products and services, the two main aspects to be discussed in detail are:

1. The requirements that the mines need to apply in terms of quality and quantity, with clearly indicated deadlines as to when and what types of goods and services will be required
2. Preliminary survey on the physical capacity of local service providers to meet these requirements and the measures to be taken by the locals

As described by the OT Project, the concerns and challenges for local purchases are:15

   ● Hundreds of new Mongolian suppliers will be needed to support OT Project

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15 Commercial Challenges for the Oyu Tolgoi Project Presented by: Chad Blewitt, Chief Financial Officer, Ivanhoe Mines Mongolia Inc in the Oyu Tolgoi SIA workshop held in Ulaanbaatar, 21-22 April 2009
Intention to adapt the Rio Tinto procurement policy wherein all suppliers are treated equally
- Total commitment to the health, safety and environmental aspects of local procurement and business and ethical compliance
- Consult and work with suppliers for mutual benefit
- Upgrade mine-provision experiences for Mongolian suppliers
- Develop Mongolian suppliers to become long-term business partners
- Develop and implement an appropriate supplier-audit and training program

On their side, the locals believe they are able to supply the mines’ meat and milk needs from all types of livestock. In other words, producers are psychologically prepared without knowing the actual requirements to become a supplier and, in this regard, many details need to be worked out.

- A rough estimate suggests that the mines may purchase meat, for example, limited to beef, mutton and goat meat.
- Herd health appears to be a concern for both sides and only half the herders in the OT Project impact area assume that the availability and quality of animal health services is satisfactory (see 10.11 in the OT Project impact area baseline study).
- A lack of basic facilities for primary processing would mean that there would be continued failure to produce better quality products.
- Predominantly household processed products without proper packaging and safe storage would appear to be a limiting factor for a wide range of local supplies
- To meet the volume of products the mines would purchase locally, local producers may be forced to increase herd productivity
- Crop growers are far less productive and insufficiently prepared to become reliable suppliers. On average, the soums in the OT Project impact area annually cultivate 3.4 ha of land and harvest 21 tonne of potatoes and vegetables, with 80 percent being potatoes (see 4.3 Crop production, the OT Project impact area baseline study). The locals will need to introduce reliable and water-saving irrigation technologies and high-yielding cultivars to increase harvests of diverse crop products.

Purchasing locally produced agricultural products and services will give two important direct positive impacts: (i) adequate and well-managed response to local expectations and, (ii) promoting local producers towards improved high quality outputs and SME development. For the mines, this will contribute to cutting transportation costs, as it has been recognized that transporting food and other simple service inputs from China or Ulaanbaatar is a large cost factor for the mines.

Local purchases will trigger radical changes in the technological basis for local agricultural and food production. Promoting SMEs, specifically agroprocessing is a key development goal for all soums in the OT Project impact area. In response to unified and high standards for supplied products and services, the locals need to think seriously of establishing small-scale soum-based processing plants and workshops based on modern technologies.

It is hoped that the specific marketing environment around supplying the mines may force producers and service providers to work towards extended cooperation in the spheres of
production and marketing. This may grow into local producers’ associations, or marketing groups, or a combination of both.

Generating income from livestock and crops, as well as from other services, by selling to the mines is new to the Umnugovi aimag communities. This has emerged with the mines, and people will see it as a result of the mine-specific local purchase policy.

It is anticipated that purchasing food products and services from local suppliers may lead to competition for specific segments of highly concentrated markets, namely, the mines. The extent of expectations to sell products and offer services is enormously high, among not only the locals, but also a number of „outsiders”, to benefit from the emerging market opportunities. Therefore, not every producer and/or service provider will be secured as a supplier.

Mass penetration by non-local sellers/suppliers may lead to quick exhaustion of the window of opportunity for the locals unless these producers, Government and the mines work together to protect mine-centred markets.

It is obvious that current practices, such as, unhygienic in-field livestock slaughtering and primitive household processing, will not be changed/converted rapidly to use modern techniques. The mines may need to recognize this process as inherent to a production system dominated exclusively by pastoral farming.

MANAGEMENT

Local purchasing should be an entrenched principle in the OT Project IDP and the development plans of other mines. At present, not all mines have developed distinct and integrated local purchase policies and/or local purchase action plans. Managing impacts from local purchasing appears appropriate, provided these are designed to upgrade local capacities by introducing innovative technologies and building production management skills. As the mines have not been clear and no statements have been released as how local purchases will start, it is not anticipated local producers will be able to reach consensus and respond quickly. Disclosing the local purchase policy to the locals as soon as possible will be conditional for this policy to work in the interests of both parties.

Promoting local producers and services and keeping them encouraged will require firm business partnerships. Therefore, it is proposed that the OT Project should draw up a strategic partnership development plan, within which all the mines should cooperate with the locals towards implementing the OT Project long-term local purchase program.

The specific requirements for this program are to:

- Build up local producers’ and service providers’ capacities in terms of output quantity and quality to meet the mines’ requirements by providing on-site training and exposure to best practices
- Overcome strong seasonality in livestock and crop production to ensure supply continuity for products and services
- Promote local processing by introducing hygienic and safe technologies
**RESIDUAL IMPACTS**

Impacts anticipated to be generated by the mines in terms of local purchasing will be predominantly positive. In order to enrich these impacts by maximizing positive benefits for local communities, the Project may initiate further measures to share these conditions and other facilitating circumstances with other soums outside the impact area, thereby enabling local development to be promoted across the whole aimag.

In order to successfully implement the local purchase policy, it should comply with local development strategies and program, for example, the Umnugovi aimag long-term (2005-2020) program for agricultural development, as working together with this program would enrich the Project’s residual impacts to a large extent.

### 9.4.2 Population growth

Population impacts both in terms of numbers, movements and cultural cohesion are often the primary impacts of a mine on the social environment. This section considers the existing population and the OT Project contribution to this, as well as issues such as diversity, gender and family structure. The continuing appraisal of the impact of population rises and falls in accordance with mining operations is an area that the OT Project should continue to track as it moves through this transitional phase.

**STAKEHOLDER CONCERNS**

The following list shows population concerns and their potential impacts, which might be created by the OT Project phases. These concerns were flagged by local stakeholders.

**Concern #1: Migration from other aimags/soums/cities** - Population migration into mining areas is an area of concern. The OT Project may result in the in-migration of direct and indirect employees (and their families) from elsewhere in the country and overseas, which would contribute to population growth, particularly to working age population growth.

**Concern #2: Gender Imbalance** – The OT Project will create direct and indirect sex-selective employment. Thus, the sex ratio of population in the Project impact area tends to
gradually grow, as a result of increased employment favorable to men. The lack of opportunities for female residents was raised as an issue by SIA participants with comments made that the mine does not open substantial employment opportunities to women.

**Concern #3: Instability and breakdown of family** - Due to the OT Project activities, there will be changes in residential patterns and modifications of working strategies - particularly among married men.

**POTENTIAL IMPACTS**

The OT Project will lead to population growth. Locals expect that the population of the Khanbogd and its surrounding *soums* will be increased due to in-migration, and may result in population concentration. Participants among FGDs\(^{16}\) said that the main reason for moving into and living in the OT Project impact area would be employment rather than lifestyle.

OT Project activities may also trigger population growth that would increase the working age population of the Project impact area. In-migration affects all ages, particularly the working age group. This changed population age structure may have significant effects on economic performance.

Increase in population growth is a direct and indirect impact of the OT Project, as well as both positive and negative impact. The impact will be realized during the construction and operations phases throughout the OT Project impact area.

With regard to the in-migration of workers, during construction, OT expects that 3,000-5,000 (comprising both foreigners and national) construction workers will come from outside the OT Project impact area. The construction phase is temporary (3-4 years estimated for OT), the majority of workers are housed in camps\(^ {17}\) and there is little integration with local communities. During operation, OT anticipates that up to 3,000 workers will come from outside the OT Project impact area to live in the OT Project impact area.

As operations jobs will be long term (more than 40 years for OT), these workers will be encouraged to move to the OT Project impact area with their families\(^ {18}\). With respect to the in-migration of job seekers, it is very difficult to estimate the potential magnitude of this growth with any accuracy. These newcomers will come to the Project impact area looking to participate in the employment opportunities generated by OT Project. The contribution to the employment base and economic reliance issues illustrates a greater impact and this is discussed in the Employment section.

The benefits of population growth include the following:

1. Increase in economic performance and productivity - discussed in the local economy, local business development and infrastructure section
2. Expansion of local markets – discussed in the local economy, local business development and infrastructure section

\(^ {16}\) SIA-FGDs summary notes, OT Project area
\(^ {17}\) Oyu Tolgoi: Mongolia, Housing Strategy (Draft), November 2007
\(^ {18}\) Oyu Tolgoi: Influx Risk Assessment, October 2007, Barclay & Associates
Besides these benefits, there are a few areas of potential concern:

1. Increase in pressure on social facilities, infrastructure, and government services – discussed in Health & Safety, Education, and Community Impacts sections

2. Increase in pressure on housing stock – discussed in the Local economy, local business development and infrastructure section

3. Conflict between locals and outsiders – discussed in the Government services, safety/crime infiltration and resettlement section.

It is observed that the mining industry in general has comparatively fewer women in direct employment than other industries. Traditionally, women have had very little involvement in exploration, mining and mineral processing activities. The direct involvement of women in formal, large-scale mining is generally limited to support activities such as management, clerical, security, catering and related jobs. This impact will also be observed at the OT Project. Gender imbalance is a direct, negative impact from the Project and it will result from construction and operation phases of OT Project activity, but particularly the operation phases. It will be direct in nature.

With regard to gender imbalance, there are a few areas of potential concern:

1. Increase in reproductive health problems including abortion, incidence of STIs etc. – discussed in the Health & Safety section

2. Decrease in women’s labor participation rate – discussed in the Employment section

Change in family formation and wellbeing is a direct, negative impact of the OT Project. Major causes of this impact are a combination of several types of recruitment and accommodation types, i.e. work rosters and commuting arrangements, of the OT Project, and new residential patterns in the Project impact area.

On the one hand, direct or indirect male-employment, which is created by the OT Project, may have negative consequences on the wellbeing of married people as well as on their children. Workers may suffer loneliness and anxiety over the families back home, and a cold reception from family members, who have been estranged from them over long periods, when they return. Separated spouses form other relationships that may eventually break up homes and families.

On the other hand, the families who are left behind also may have their share of suffering. In some cases, the father’s/mother’s absence may to be felt to contribute to the decline in his/her children’s school attendance. In addition, it may happen that some children would suffer emotionally from the absence of their fathers/mothers, particularly when the grandparents are unable to give them sufficient attention.

The impact will be realized during all phases of the Project activity, but particularly the operation and closure phases.

This impact may have the following potential concerns:

1. Increase in reproductive health problems including abortion, incidence of STIs etc. – discussed in the Health & Safety section
2. Negative consequence on children’s education and discipline
3. Increase in separated or divorced partners or single parents

MANAGEMENT

Both OT Project and the Governor of the Khanbogd soum need to engage with the Local Development Plan to ensure that the community integrated development plans are adjusted to provide for this influx of population. Other authorities in the area such as the police services, health services, and education sector should also be consulted on the issue. The site of temporary accommodation is an important consideration and needs to be carefully planned so as to minimize any disruption to existing residents. Careful planning will also need to be undertaken in respect of the burden that will be placed on existing infrastructure. It is highly unlikely that the local governor alone will have the resources to cope with the predicted demands and it will be important that both OT Project and the Local Governor invest in infrastructure in the vicinity of their respective operations. It should be noted that expansion would take place over a period of time and that after reaching a peak it will taper off. This must be catered for in planning to deal with this influx of people.

OT Project is committed to maximizing local participation in the employment opportunities generated by the Project. To do so, the OT Project will clearly define an Employment Action Plan, the goal of which is to seek ways of maximizing the participation of – in order of preference – OT Project impact area residents, and nationals in the direct and indirect employment opportunities provided by the Project. This commitment to favor local residents for direct and indirect employment will moderate the number of workers and job-seekers that migrate to the area relative to similar projects that make no such commitments.

The OT Project impact area will experience a severe increase in population on a temporary and permanent basis. Temporary rules and regulations for moving into, temporarily staying in and moving out of the Umnugovi aimag (and Khanbogd soum) should be approved by an order of the Khural of People’s Representatives of the aimag (and Khanbogd soum) in order to regulate immigration related issues and to provide conditions for normal operation of civil registration activities at the aimag and timely reporting of data.

Impacts on gender (especially in favour of women) shall include a deliberate policy to increase employment chances for women. This will be achieved by introducing encouragement of female-workers through an OT Employment Action Plan. In addition to the increased employment opportunities, there will be increased income generated from emerging demand for services such as restaurants, small shops and allied activities which tend to favour women.

If OT Project expects to recruit direct and indirect employees (with or without families) from outside the OT Project impact area, the “family-friendly” Employment Action Plan might be implemented. This will be intrinsically related to types of family-friendly working arrangements in order to mitigate the above-mentioned negative impacts. This plan may well include issues on recruitment of family members, and work-life balance.

In addition, OT Project may implement an Employment Action Plan that will minimize the number of workers that have to be brought in from outside the OT Project impact area.
9.4.3 Employment

STAKEHOLDER CONCERNS

Concern #1: Employment opportunities for locals – The Project will generate employment. IMMI plans to maximize Mongolian employment levels (achieve a 90 percent national workforce by the fifth year of operation). In addition to direct employment, there are possibilities that local communities will provide services and supplies to the mine camps and local area, as a way of generating indirect employment.

Concern #2: Skills development training - IMMI plans to establish significant training resources and facilities. IMMI is entering a critical phase with regard to setting up the training systems and processes. A minimum 3-year timeframe is needed to plan for and train a workforce to be ready for operations.

Concern #3: Employment opportunities for expatriates - Initial staffing of the OT Project will include a combination of expatriates and Mongolians. Expatriates will fill senior management roles. These individuals will be among the leaders in their fields of expertise and will have hands-on experience from other major mines. Other expatriate personnel with specific technical expertise will assist in training and in implementing operational procedures in the early years of the operation.

POTENTIAL IMPACTS

The OT Project will generate a significant amount of employment for locals. Employment is a direct, positive impact of the Project and it will result from all phases of Project activity, but particularly the construction and operation phases. Beneficiaries by geographic area are the OT Project impact area, the country as a whole, and other countries.

Project-generated employment will be both direct and indirect in nature. IMMI plans to maximize Mongolian employment levels. In Khanbogd, approximately 40 km from OT site, 10 percent of the 2,500 people living in the soum are Ivanhoe employees and contractors or members of their families – all directly supported by full-time jobs at the OT Project. In general, the employment rate of the citizens in OT area soums is estimated to depend on jobs indirectly created at OT.

There are hopes amongst the local communities that it will be possible to provide services and supplies to the mine camps and local area, as a way of generating indirect employment. These expectations range from ambitions to supply meat and milk (for instance building a new dairy farm), to herders directly selling meat and milk products and a hope that light industries will develop to serve the mine camps (including machinery repair etc.).

The Company is planning to employ a peak workforce of close to 3,000-5,000 workers during the construction phase and employ 2,500-3,000 workers during the operation phase. The level of education in Mongolia is comparable to that in many Western countries, with almost universal literacy and a high participation rate in tertiary education. However, Mongolian exposure to the particular technical and trades skills that will be required for the OT Project operation has been limited. IMMI plans to establish significant training activities and facilities and enters a critical
phase for setting up the training systems and processes. A minimum 3-year timeframe is needed to plan for and train a workforce to be ready for operations. Training activities will be provided for local citizens to acquire the necessary skills for working at OT Project.

The number of expatriates will be relatively large at the beginning but will eventually be similar to levels at world-scale operations in developing countries run by Western companies. Expatriates will fill senior management roles. These individuals will be among the leaders in their fields of expertise and will have hands-on experience from other major mines. Other expatriate personnel with specific technical expertise will assist in training and in implementing operational procedures in the early years of the operation. Their goal will be to bring the Mongolian workforce to skill and knowledge levels that permit them to replace most of the initial expatriates.

Table 9.3: Initial Operations Work Force Estimates

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Expatriates</th>
<th>Total Employees</th>
<th>Expatriate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>120</td>
<td>1112</td>
<td>10.79</td>
</tr>
<tr>
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<td>109</td>
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<td>3.72</td>
</tr>
<tr>
<td>12</td>
<td>26</td>
<td>1174</td>
<td>2.21</td>
</tr>
</tbody>
</table>

Source: OT Project – IDP08, Section 2- Country and Regional Settings

The benefits of OT Project-generated employment include the following:

- Increased employment. The greatest expectation of the local community is employment creation. It relates directly to the high rates of unemployment and poverty currently prevailing.
- Increase in household income. OT project will generate employment and induce economic activity, which should lead to higher incomes for participating households.
- Indirect employment. More employment sources and possibilities to work in the mining area and service sector.
- Skill development for locals. The Mongolian workforce’s skill and knowledge level will be increased by working with expatriates and by attending skill development training.

Although Project-generated employment has direct and positive impacts, there might be a number of indirect and negative concerns:

- Disaffection among locals at outsiders taking jobs. Locals have a high expectation of employment. 400 people from the Khanbogd soum have registered for employment by OT but not many have been hired. Currently, only five people are working at the OT Project office and around 100 locals are working at the OT Project-contracted CSI catering company as firefighters, cooks, food servers and cleaners. Although, most of the locals agree that their skills do not fully meet the requirements of the OT project there are still locals who think outsiders are taking “their” jobs. OT Project’s main goal of recruitment and training strategies is to ensure that preference is given to hiring from Umnugovi communities through a transparent and fair process. The importance of an active succession planning process to enable Mongolians to gradually fill senior positions is paramount.
- Conflicts between locals and outsiders. Access to OT Project-related employment, population growth and perception of the imbalance between benefits and impacts. In addition, differences between locals and outsiders such as religion, language, income etc might create conflicts. The OT Project community relations approach is to build enduring relationships with
its neighbours that are characterized by mutual respect, active partnership, trust and long-term commitment. Good management of community relationships is necessary to OT Project business success. Good performance requires accepting responsibility for community relationships. Locals pointed out that an English language program may be implemented as a part of the training program; it would help locals to communicate and work closely with expatriates.

- Gender impact on labour force participation. Mining employment tends to favour males thus limiting opportunities for women to obtain jobs. The OT Employment Action Plan encourages female-workers – both as employees and contractors.

**MANAGEMENT**

IMMI plans to maximize Mongolian employment levels and achieve a 90 percent national workforce by the fifth year of operation. The OT Employment Action Plan should focus on maximizing employment-related benefits, and manage the potential concerns described above. Mongolian exposure to the specific technical and trade skills required for the project has been limited and an extensive training program will be required to achieve this level of local participation.

The OT training strategy includes conducting a labour census of the population in the Umnugovi to understand the sources of skilled and unskilled labour. In addition, the OT Project training strategy includes conducting a training needs analysis (TNA) for the OT Project. The TNA will allow IMMI to identify the skills needed and identify gaps that may be addressed through extensive training programs.

IMMI is entering a critical phase with regard to setting up the training systems and processes. A minimum 3-year timeframe is needed to plan for and train a workforce to be ready for operations. Training activities will be provided for local citizens to acquire the necessary skills for working at OT Project.

A significant opportunity exists for IMMI to work closely with educational institutions and local and national government to develop sustainable, long-term training programs that will help develop a skilled Mongolian workforce able to fulfill the labor requirements for the OT mine site. In order to implement the training strategy, community-based involvement and government support is essential.

It is clear that IMMI needs to take a strong leadership role in the development of training systems across the mine site and make some immediate decisions about training and staff development. In addition, a focus on developing a deeply ingrained culture of safety within the workforce to international standards is essential. Understanding modern mining methods, mineral economics and international practices in training for locals is important.

**RESIDUAL IMPACTS**

- The greatest expectation of local community and government officials is employment creation. Obviously, employment creation will influence the high unemployment rate. The benefits associated with increased employment are expected to be significant.
- There are hopes amongst the local communities that it will be possible to provide services and supplies to the mine camps, as a way of generating indirect employment. OT Project should
try to improve the local supply chain by local procurement of food and non-food items, for instance, vegetable and meat supply, and uniforms for workers etc. If this is done, local income sources and income will be increased. Currently, OT policies on purchasing only certified products meant that catering had to be supplied from Ulaanbaatar. Locals would like to supply their own product to the company, and are committed to know the company’s necessities and would like to start preparing for supply.

- Locals pointed that their skills do not fully meet the requirement. Locals are interested in finding out from the company which skills and trades the company needs at the mine sites, so that the soums could initiate training schemes to meet these needs.
- Locals would like to work in the mining sector with their family members. However, employment in mining generally requires more labour, thus it is difficult for women to be hired.
- The impacts of the employment on household income levels is difficult to estimate with any certainty, but is anticipated to be positive: i.e., worker households will likely benefit from increased income because of their employment.

In summary, the increased employment associated with the OT Project is expected to be a positive, long-term and significant Project benefit. The OT Project plans to maximize local participation in the direct and indirect employment opportunities generated by the OT Project. Skills development training programs are likely to play an important role in the successful implementation of the Employment Action Plan. If all of these positive impacts are harnessed over the life of the mine, the potential for long-term economic sustainability is great and could leave a substantial positive residual impact.

9.4.4 Health & safety

STAKEHOLDER CONCERNS

Concern #1: Reduced access and range of health care services - Increased population density and in-migration process maximizes the pressure on existing services.
Concern #2: Epidemiological change and mortality and morbidity differences among population groups - Foreign and domestic labour force of reproductive age will be increased.
Concern #3: Reproductive Health (RH) access and Family Planning (FP) services and their quality
Concern #4: Changes in the living environment affect health issues - Increased number of vehicle movements, reduction of drinking water, noise, emissions, dust and air pollution will be major problems.
Concern #5: Impacts on food safety - Due to increased population growth, food demand will be increased and problems associated with the quality and safety of food would be crucial

POTENTIAL IMPACTS

Due to project implementation, population and worker numbers will be increased. It will influence the access and range of health care services. Due to increased population density, caused by in-migration, access to health services will be decreased. Health organizations will be overloaded and this will cause a shortage of health facilities, equipment and human resources. In particular, hospitals of the Khanbogd soum which is the Project impact area of the OT project,
are going to be overloaded. Hospitals in the areas of indirect impact are likely to have the same problems. According to *soum* hospital operational standards, the number of physician assistants depends on the number of *baghs* (districts)\(^\text{19}\). In the four rural *soums* of Umnugovi *aimag* near the OT Project, there are an insufficient number of assistants. In 2007, hospitals of the Bayan-Ovoo, Manlai and Tsogttsetsii *soums* had one physician assistant less than the required standard and the Khanbogd *soum* hospital had the minimum standard. The fulfilment of the required standard at the *aimag* level is 79.2 percent\(^\text{20}\).

Even though a new hospital was built in the *aimag* centre, it still lacks specialized sections and specialized doctors to deal with occupation originated diseases, allergic reactions, injury, gynaecology and diagnosis. Since there has been more of a focus on delivering a quality health service for the *soum* population and in–migrants there is a probability that people from remote areas do not have adequate access to quality health services. More population may not affect access to health services; however, it will certainly affect its quality. More population will increase the workload of medical personnel, therefore, basic health care services delivery will be faced with difficulty in dealing with temporary migrants and unregistered residents.

Due to increased population density, the incidence of communicable and non-communicable diseases will be increased and causes of morbidity will be expected to change. Specifically, accidental injuries, circulatory system disease and dust-caused respiratory disease will increase. In the last few years due to direct, indirect and cumulative impacts of the various mining projects, occurrences of some types of disease have become more frequent. For example, the number of accidents has increased; and air and rivers have been polluted as a result of active mining operations at macro- and micro- levels. Also, occurrences of non–communicable diseases such as circulatory system disease, dust–caused respiratory disease, allergic reactions, lung disease, windpipe inflammation and cancers as well as communicable diseases such as TB and hepatitis A are becoming more frequent.

In 2007, the following were the five leading causes of outpatient morbidity in the five Project area *soums* of Umnugovi *aimag*: 1) Respiratory system diseases; 2) Digestive system diseases; 3) Genital-urinary system diseases; 4) Circulatory system diseases, and 5) Skin and subcutaneous tissue problems\(^\text{21}\).

It is expected that the implementation of the OT Project shall result in an increase of population of reproduction ages and concomitant changes in the service quality of Reproduction Health Centers and Family Consultancy Centers in the areas of direct, indirect and cumulative influences of the project. According to Umnugovi Health Statistics, in the last three years (2005-2007), the incidence rate of syphilis has increased in the Manlai *soum* (4.0 per 10,000 persons in 2007) and the gonorrhoea level is higher in the Tsogttsetsii *soum* (9.4 per 10,000 persons in 2007) and Khanbogd *soum* (3.4 per 10,000 persons in 2007), and the trichomoniasis level is increased in Manlai *soum* (16.2 per 10,000 persons in 2007, which was increased almost 4 times

\(^{19}\) Soum hospital operational standards, 2001
\(^{20}\) Umnugovi aimag Social, Economic and Environmental Baseline Survey, 2008. Available at www.umnugovi.mn
\(^{21}\) Umnugovi aimag Social, Economic and Environmental Baseline Survey, 2008. Available at www.umnugovi.mn
Common STIs have increased in the Dalanzadgad soum. That is explained by reason of in-migration and the many young people who were relocated (away from their families) for certain periods of time. This accumulation of labor force in the areas of direct, indirect and cumulative influences of the project (thus increase of population numbers) could even attract prostitutes thus exposing people to the risks of being infected by STDs/HIV/AIDS. Also, the fact that people who are coming from China do not have to have medical check ups anywhere and that might also be one of the factors contributing to the spread of STDs. In addition, the number of women having abortions as a result of extra-marital relations might increase which could lead to negative consequences such as infertility and/or a maternal mortality rate increase.

It should be noted that local doctors related the increased occurrences of other types of communicable diseases (except for STDs) to their outbreak frequency (last outbreak was in 2005 – 2007). According to the local doctors, the outbreak frequency is 5 – 10 years and it likely it will happen during certain stages of the project implementation.

Attention should be paid to the fact that when in-migrants come to the Gobi from other regions of Mongolia, they have a hard time to adjust to the local climate and become prone to high blood pressure, fatigue and insomnia.

At the national level, the fertility rate has been increasing, in particular among households with low income. That trend is also observed in Umnugovi aimag. In the last five years, the numbers of disabled children have increased. That means the number of those who need the state welfare benefit is increasing. Inaccessibility to the state welfare benefit or poverty might lead to malnutrition of pregnant women and child mortality.

It is appropriate to mention efforts made by the OT project over the last few years towards increasing the accessibility of the local population to health service and improving its quality, including:

- A 5-year scholarship programme for 23 Doctors is being implemented (2004-2009). At the moment, 14 of them are already working in 11 soums of Umnugovi aimag. 37.7 million MNT has already been spent on funding of the programme.
- During 2006 – 2008 Health Consultancy Centers were established in 12 soums. 300,000 USD was spent on funding the project.
- A dental hospital was established in Khanbogd soum.
- Assessment on the capacity of health organizations, service outreach and population health has been conducted in the aimag and soums.

Implementation of OT project has a high probability to cause some negative consequences in the areas of direct and indirect influence of the project such as dust, air pollution (due to transportation vehicles); noisiness, rattling and contamination of drinking water sources as well as drinking water scarcity.

In comparison to Standard MNS 900:2007 specified in the „Hygienic requirements for drinking water, control and supervision”, samples taken from water sources No. 67, 85, 86, 89 and 90 in the Tsogtsetsii soum had high mineralization, exceeding by 1.5-3 times the allowed level, fixed
by the Standard, and the chloride ions and sulphate ions content in Sample 86 exceeded by 1.5-3 times that fixed by the Standard. The samples taken from water sources No. 14, 16, 21 and 27 in the Khanbogd soum had high mineralization, exceeding by 1.7-2.5 times the allowed levels, fixed by the Standard. As to hardness, water sources No. 14 and 16 exceeded the allowed levels by 1.5 times and the chloride ions and sulphate ions content was 2.5-3 times higher than levels fixed by the Standard. In the Bayan-Ovoo soum, the samples taken from the points with the samples numbered 8, 15, 17, 18 and 21 indicated a high level of mineralization, exceeding by 1.4-5.6 times the allowed levels fixed by the Standard and, as to hardness, water point No. 17 had an indicator exceeding the allowed levels by 1.4 times. As to the chloride and sulphate ions content, water points No. 8, 17, 18 and 21 exceeded by 1.2-2 times the levels fixed by the Standard, and the sulphate ions content at water point No. 15 exceeded the Standard by 6.5 times22.

Due to excessive water hardness, the occurrences of kidney disease have increased. There is no technology in place to soften water and insufficient research on water quality and changes to its elements has been done. Since these have not been done and assessments on how exploration activities of mining companies are impacting drinking water sources of the local community (of the project direct and indirect impact areas), people are still doubtful about quality of the water they are drinking.

Due to the combined impacts of multiple mining companies, dust generation has become an issue in local areas.

It appeared that citizens and employees in the Project’s indirect and cumulative impact areas have a lack of awareness and information on labour safety rules and regulations and that is becoming one of the reasons for road accidents, which have started to occur quite often.

During the last few years, the OT Project has conducted the following surveys and study:

- Baseline survey on capacity of health organizations, service scope and population health at aimag and soums level;
- Water Perception Study in the Khanbogd soum in 2007;
- Water survey among herder households living in the area of Gunii Khooloi.

Officers from Professional Inspection Agency in the Umnugovi aimag expressed their concern about frequent violations of the procedures and regulations on food safety; and there are not enough inspections in terms of hygiene of selling places and storing conditions for food in these places. Therefore, it is common for people to sell products, which are stored in dirty places or not according to instructions or with expired dates. In 2007, the Professional Inspection Agency of Umnugovi aimag conducted an inspection of 3476 economic entities and individuals who are engaged in food products trade and confiscated products worth 156.2 thousand Tugrugs23.

That shows that the procedures and regulations on food storage and safety are being violated in the areas of the Project’s direct and indirect impacts and the reasons given were: inconsistent power supply; having no lab to test imported products; no proper storage facilities for animal

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22 Umnugovi aimag Social, Economic and Environmental Baseline Survey, 2008
23 The Professional Inspection Department of Umnugovi aimag, 2008
originated products; and no tools and equipment for on-the-spot testing. As the OT Project grows, (increasing the number of people) the demand for food products is likely to be increased.

**MANAGEMENT**

It is recommended that in designing and implementing projects and programmes on improving the capacity of health organization; ensuring work safety and reproductive health (including issues related to HIV/AIDS) of the target population in the areas of direct and indirect influence of the OT Project, that the soum Governors should consider these issues and base initiatives on the participation of local communities.

In connection with the OT Project implementation it is recommended that the following be done by the government of Mongolia, local Governors and the OT Project:

**Government of Mongolia:**
- Considering population increase in general and increase of temporary residents in the area, create the legal environment for the health budget to be flexible.
- Establish “The Intersoum Diagnosis and Treatment Centre” for the eastern soums (including the areas of direct and indirect influences of the project) and provide incentives for skilled doctors and other medical personnel to come and work for the Centre.
- Improve the initial population registration thus creating equal access to health and ambulance services for permanent, temporary residents and poor people.
- Implement national health programmes and other projects and programmes specifically for the areas of the direct and indirect influence of the project.
- Develop procedures for compulsory medical check ups prior to issuing work permits to foreign citizens and the local authority should check on enforcement.
- Also, the Government of Mongolia should provide financial assistance for the establishment of “The Inter-soum Diagnosis and Treatment Centre” for the eastern soums (for the purchase of necessary technical equipment).

**OT Project:**
- It is very important that the feasibility study of OT Project should investigate possibilities for employees to bring their family to the Project area when they relocate to work.
- Investing into regular and refresher training for doctors and other medical personnel. Programmes on training nurses and incentives to be provided for staying in rural settlements may be implemented.
- The OT project may pay attention to giving financial assistance for implementing national programmes on public health and reproductive health/ a family center. In order to change the sexual behaviour of Mongolian and foreign young men, training or information on RH/STDs/HIV/AIDS as well as preventive check ups/tests should be provided on a regular basis. Young herders from rural areas may become one of the target group for those activities.

The Government of Mongolia and mining companies that are operating in Umnugovi aimag should work together to design and implement an Action Plan on reducing dust and noise levels as well as improving the accessibility and quality of drinking water. They may get some of the
funding from other companies that are operating in the area and contributing to cumulative impacts.

In order to improve safety in mining sites, the OT project and Government of Mongolia should collaborate on promoting safety among local citizens, herders and employees; conducting inspection on techniques and equipment maintenance and establishing the Center for Medical examination and testing for drivers (in particular in the area of cumulative impacts).

The Government of Mongolia should improve inspection of chemical substances appearing as a result of production, in particular in the gold mining sector.

An action plan on food safety and its monitoring is required. The involved Parties need to do the following:

The Government of Mongolia should establish labs in Umnugovi aimag and some soums for testing imported products and provide inspections officers with guidelines and recommendation on handling food safety issues. Standard food storage facilities are needed in the areas of direct and indirect influence of the project.

In order to meet the demand for vegetables in the areas of direct and indirect influence of the project, the OT project may assist with technical and financial assistance on maintaining green houses and staff training for this purpose.

9.4.5 Education

STAKEHOLDER CONCERNS

This section summarises the concerns of local residents to show the potential impacts of the OT Project that may affect educational service in OT area soums.

Local stakeholders’ assumptions of the potential impacts of the OT Project on the educational sector focused on the following four major issues:

Concern #1: Capacity and facilities of educational institutions: It is necessary to increase the capacity and improve facilities of educational institutions. In the course of the baseline survey, it was observed that the load of schools and kindergartens in the project impact region has increased in the last few years and they operate exceeding their capacity. Over the last years many young families have moved to the project impact region seeking jobs at the OT and Tavan Tolgoi mining projects, the administration and teaching staff of local schools and kindergartens noticed that there was a trend for an increasing number of new students in the coming years. With increase of the school load, the load of dormitories will also go up.

Concern #2: Educational level of population: Although the OT Project is interested in recruiting qualified professionals from the local area, the baseline survey results showed that the educational level of the population in the project region is below the average of that in Umnugovi aimag. In particular, 25 percent of the total population aged 10 or above covered by the survey in the OT Project region had primary education, 34 percent had incomplete secondary education, 19 percent had complete secondary education, 4 percent had vocational education and
seven percent had higher education, and 11 percent was non-educated. These data illustrate that there is lack of necessary qualified professionals for OT and Tavan Tolgoi mining companies in the project region.

**Concern # 3: The school drop-out rate:** In comparison to the early period of transition to market economy in Mongolia, the school drop-out rate has decreased in urban and rural areas in the last years and the phenomenon has been almost eliminated. Statistics show that only a few children have dropped out of school in Umnugovi aimag due to health problems. There is a speculation among local citizen and the related officials that the school drop-out rate might probably increase compared to the present level with implementation of the OT Project.

**Concern #4: Sufficiency and supply of teching staff and teacher development:** According to the baseline survey, there is shortage of professional teaching staff in schools and kindergartens. Apart from a fact that one teacher teaches two or more subjects (some teach subjects different from their professional field); there are many teachers without professional qualifications. Along with shortage of teaching staff, representatives of general public speculated that some teachers were interested in leaving their jobs if they found well-paid jobs in the OT Project.

**POTENTIAL IMPACTS**

An increasing migration of population, who come to find work, is the main cause of potential impact to the pressure on school and kindergarten services, capacities and facilities. The population migration directed towards the project impact region will start with the process of opening workplaces with implementation of the project and it will be a direct negative impact. According to the OT Project plans, one half of workforce is to be located in three soums in the vicinity of the mining area, namely, the Manlai, Bayan-Ovoo and Khanbogd soums and the remaining part is to be organized to work on appointment or on a half-settled basis, so this impact might be present in the entire project impact region. As for the time being, migration will increase largely during the construction period, but will relatively decrease and stabilize during the mining period. Although migration of single young people will be dominant, supposing that at least 5 percent of total migrants are families /young couples or families with children of school and kindergarten age/, the impact on people will be medium and the probability of occurrence of the impact is high.

It is determined that potential impact of the increasing number of qualified professionals and population with higher education may arise due to the following causes:

- Increase of in-migration of professional staff
- Increasing interest in obtaining professional qualifications in the mining field among local youth
- Development of a new course in a major necessary for the mining sector at the Professional Vocational Training Centre of Umnugovi aimag for training of professionals or establishment of a branch school of the Mongolian University of Science and Technology
- Training of workers by the OT Project

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24 The Umnugovi aimag Khural of Citizens’ Representatives, Governor’s Office and Umnugovi Development and Research Foundation. Umnugovi aimag Social, Economic and Environmental Baseline Survey, 2008
25 Public consultation workshop notes on socio-economic impacts of Oyu Tolgoi project impact region, Khanbogd soum, 2009
These causes are directly dependent on the activities of the OT Project and other mining companies. Therefore, they are direct impacts. Obviously, an increase in the number of highly educated professionals in the project impact area, where the educational level of population is lower than the aimag average, is a positive impact. A sharp increase in the number of qualified professionals and population with higher education at the project construction stage, and then a slight increase in the number of more specialized, highly skilled professionals at the mining stage, finally, at the end of the project, intellectual investment can remain in the project impact region as a positive impact. Since the number of necessary workplaces in the OT Project is limited, the scope of impact on people is medium, but the probability of occurrence is high.

With implementation of the OT Project, there are several impacts that may be created through intermediary factors, although they are not directly correlated to project activities.

The school drop-out rate may increase with implementation of the OT project. It has the following causes:

- Children will leave their school as control over children left at home weakens, when people migrate to work in the OT Project region;
- Children from herder households will leave school to work as herders due to lack of workforce in livestock breeding;
- Children from poor families will herd livestock for other families as hired workers;
- Children, who participated in migration, will not make their school transfer registration and will have lack of information etc.

It is possible that the situation of the increase of the school drop-out rate will take place not only in the project impact region, but also anywhere at national level, and will probably happen at the construction and exploration stages of the project. As this negative impact will cover few people, the scope of impact is small, but the probability of occurrence is medium.

Another indirect negative impact, which might take place due to the project, will be the decrease of sufficiency and supply of professional teaching staff. While the primary cause of this negative impact is the interest of school and kindergarten teachers to find well-paid jobs in mining companies, another cause is that schools left with few students due to migration will have insufficient budget to retain their staff. This impact might possibly cover the entire project area and will emerge at the construction and exploration stages of the project. Supposing that the number of teachers interested in changing their jobs is not very large, the scope of impact will be small, but the probability of occurrence is medium.

A possible impact against the abovementioned indirect impact is that schools with an increasing number of students will get a bigger budget and financing, so will have an opportunity to hire teachers that are more professional in order to reach adequate staffing. This is an indirect positive impact and the likelihood of its happening in the direct impact region of the project is high. This positive impact will increase at the construction stage of the project and then slightly decrease at the exploration stage of the project.
MANAGEMENT

Since the abovementioned direct impact is related to the development of the education sector, local administration needs to pay attention to it in order to eliminate its negative impacts. The OT project can disregard the issue of reducing the pressure on services, capacities and facilities of educational institutions as one that is not related to their activities. However, if the local administration does not take any measures to improve facilities and capacities of schools and kindergartens, citizen would view it as a negative impact from implementation of the project. That is why the OT Project pays certain attention to the issue, and will cooperate with the local administration to support measures taken by the local government and provide financial assistance.

In order to support even more the positive impact of increasing numbers of qualified professionals and population with higher education, it is proper for the OT project to take measures to provide the population with detailed requirements for positions, which are necessary in mining activities in order to provide an opportunity to prepare them for work. It is possible to support this impact by making a separate identification in the workforce policy on cooperation with the local government in supporting the Professional Vocational Training Centre to train professionals at the local level and in establishing local branches of universities and institutes. There are some activities that were implemented previously and are being implemented at present by the OT project such as the English language program and the Gobi scholarship program for students, which need to be mentioned here. These programs are the beginning of activities to be implemented by the OT Project with regard to education sector.

By exercising a family-friendly workforce policy from the OT Project, it is possible to prevent weakening of parents’ control over their children because of work. However, parents need to continue providing care to their children, and if they migrate, they should make their registration according to the rules, which will prevent increase of the school drop-out rate on paper due to lack of data and registration. Non-governmental organizations can organize activities to work with groups at risk of leaving school and to conduct consulting activities.

The OT Project can collaborate with the local administration of the aimag and soum by providing financial assistance in the implementation of programs to support teachers working in local areas, to resolve their social problems and improve their housing conditions.

The Ministry of Education, Culture and Science should follow a policy to take consolidated measures to resolve the challenging problems of schools with few students.

The OT Project may cooperate with the aimag and soum administration and related officials and provide support to employ highly skilled professional staff in local schools and kindergartens.

9.4.6 Cultural heritage

The concept of cultural heritage, as defined in this study, refers not only to physical objects, but includes intangible and living heritage aspects from the Umnugovi eastern region, as these will give an overall picture of the region’s culture and potential impacts thereon by the OT Project.
COMMUNITY CONCERNS

The Umnugovi aimag is well-known as a region rich in paleontological objects and sites that have become an integral part of its image in the country and world. This means that the local people will be concerned about possible negative impacts and a policy is therefore needed to protect and preserve their cultural heritage. The local people view as most at risk and insecure heritage items categorized as tangible and movable.

Concern #1: Increase of illegal excavation and disturbance of significant paleontological and archeological objects and sites – The Project will bring employment, immigration and population growth in its direct and indirect areas, and that may increase illegal searches for and excavations of archaeological burial and palaeontologic sites to make extra profits.

Concern #2: Changes in local traditional customs and cultural identity – The Project will generate employment and people will migrate in from other parts of Mongolia. This may cause mixed approaches to the proper conduct of rituals for local cairn (ovoo) worship, taboos and customs. According to population growth and representations by different regional cultures, local routines, customs and rituals may change and weaken. The Project will generate non-traditional or non-herding employment that, in turn, may change traditional herding lifestyles and customs. Socio-economic changes in the Project area will affect households’ emotional well-being, including their sense of ownership, place and membership. The main factors in changes to traditional culture are the globalization process and new types of employment positions.

Concern #3: Better conditions to preserve and protect cultural heritages – The Project is expected to conduct various cultural projects that may support restoring some aspects of cultural heritage, such as, monasteries and stupas destroyed during the previous regime, as well as worshipping objects ovoos (cairns), etc. The Project is also able to provide better preservation and protection management for cultural heritages in its direct and indirect impact areas.

Concern #4: Increase of religious institutions – Population growth in the OT Project impact area and the presence of different cultures may introduce other religious interests that will establish branches in the region for missionary activities.

POTENTIAL IMPACTS

Impacts on cultural heritage are defined in a broad sense as covering tangible, intangible, moveable and immovable heritage in the Project area. Potential impacts are identified as increased illegal excavations for palaeontologic and archaeological objects and at sites, loss of traditional herding knowledge, changed local traditional rituals and customs and, increased religious activities and institutions.

The main impacts that may result from mining and other activities throughout the OT Project impact area are:

- Enriching local culture and identifying with new and innovative elements
- Loss and disturbance of archaeological and paleontological objects and sites
- Improved cooperation and protection
- Reduced local cultural identity and emotional well-being
- Weakened local cultural identity due to infusion of foreign culture/s elements
• Weakened traditional lifestyles and social fabric
• Local authorities and community people may undertake some monitoring due to their expectations
• Confrontations may arise between various religious institutions/missionaries.

These days, illegal searches for and excavations of archaeological and paleontological objects, using ordinary metal detectors, frequently occur in the OT Project impact area, as well as in Mongolia’s other rural areas. Although this is definitely a cumulative impact, it is bound to continue in the future and will not be only directly attributable to the OT Project.

This has happened at the Mangasyin Monastery in the Khanbogd soum, where bronze weapons and tools were dug up and sold by people. The locals argue that the area in which the Mangasyin Monastery is located has precious metals underneath deposits. If these resources were to be mined and processed with high-technology equipment, the monastery may need to be dismantled.

The associated impacts are:
• Newcomers to the area, including mainly young people coming for employment at the OT Project mine may be interested to take precious and unique items from this land in order to make extra profits.
• Tourism will be another factor increasing interest in these objects as souvenirs illustrating the region’s uniqueness, particularly in the palaeontologic and archaeological objects.
• Increased illegal excavations may lead to eliminating cultural heritage unique to the Gobi region.

Examining impacts that a mining project may have on local customs and rituals is a challenging task, since customs and rituals constantly change as social contexts and settings for social relations change. As mining is one of the components in community life, especially in the OT Project impact area, it should be seen as a powerful factor that may affect local customs and responses.

Losses of and changes to local traditional customs may be expressed in three different forms:

1. Loss of traditional nomadic customs and civilization:
   • Weakened pastoral livestock practices in the Gobi environment, particularly camel herding, arts and traditional customs and skills
   • Lost locally unique nomadic customs and experiences for grazing management
2. Changed traditional customs and rituals:
   • Wedding ceremonies
   • Ovoo worshipping rituals
   • Community events such as Tsagaan sar (Lunar New Year)
   • Funeral customs
3. Changed kinship, ethnic and cultural identities, due to population diversity and the rapid globalization process; emergence of new identities.
The Project will generate employment and people may migrate in from other parts of Mongolia. This may destroy the proper conduct of rituals for local cairn (ovoo) worship, taboos and customs. The Project will also generate non-traditional or non-herding employment that, in turn, may change traditional herding lifestyles and customs.

According to population growth and representations by different regional cultures, local routines, customs and rituals will change and weaken.

Rituals can be changed in terms of:
- Representative figures from local community
- Forms of ritual acts
- Ritual facilities
- Number of attendees, etc.

Popularity of customs can also be observed by:
- Frequency per year (daily, weekly or monthly)
- Number of attendees
- Number of people with knowledge thereof

Wedding ceremonies, ovoo worshipping rituals, White Moon (Tsagaan sar - the Lunar New Year) ceremony, and funeral customs can represent traditional cultural patterns that carry life-cycle rhythms and cultural identity symbols. Ovoo worship represents kinship affiliations and social networks and thus symbolizes authority and integrity.

Depending on whether males will predominantly be employed at the OT Project, changes may appear in wedding ceremony elements and it cannot be said whether these will be positive or negative.

MANAGEMENT

There is a lack of information on cultural heritage in this area, with a strong conviction that cultural heritage issues relate to the Government and should be protected by it at all levels. Unfortunately, this situation has changed dramatically since 1990 and it has become evident that the Government (as represented by the Centre for Mongolian Cultural Heritage), appears unable to accept full responsibility for local cultural heritage. In addition, the local people have recognized that they are the local cultural heritage “owners”.

The people in the Khanbogd and other eastern soums thus believe that using pieces of petrified wood as souvenirs is legal and this highlights gaps in policy and regulations currently in effect. This lack of coordination between the Central and local government office could be an undesirable situation for the OT Project.

The most common and evidence-rich concern of the locals is that culturally significant objects may reduce in numbers unless appropriate protection management is undertaken by a combination of players: Central/local government, the mines and local stakeholders.
The most important challenge is the need to research for, and identify existing objects and use them to promote their value and the importance of protection among the local people. This would be the best way to include local people in the cultural heritage protection process.

One of the complaints commonly raised by the local administration is that no research expeditions and researchers report on their research and findings. In this respect, clients financing and sponsoring such work own the findings and are responsible for reporting to local authorities and submitting relevant documentation.

People anticipate that the simultaneous presence of other religious groups (at present there are none) may arise since the ethnic and cultural composition of the OT Project and other mine communities will largely be mixed but, another point about which they are most concerned is potential for conflict to arise between different religions.

All the above suggests that a general plan for the OT Project impact area cultural heritage preservation, together with potential impact mitigation measures, should be developed so that effective and integrated actions can be taken by the parties involved to preserve and protect objects of cultural and historical significance.

The key objectives of this plan:

- Examine and register cultural heritage in the OT Project impact area
- Promote local cultural heritage preservation
- Identify local stakeholders’ roles to regulate and preserve cultural heritage
- Identify the mines and other stakeholders’ roles to regulate and preserve cultural heritage
- Support local museums and other buildings where cultural heritage items are stored or displayed as collections
- Support restoration to damaged items
- Cooperate in actions to protect immovable tangible objects by fencing or taking them under local protection.

RESIDUAL IMPACTS

It is well known that cultural heritage sites and items that have been preserved by the locals over centuries are objects that all people and organizations, including visitors and in-migrants should sanctify and protect against undesirable impacts. In this respect, better preservation of and restoration for cultural heritage would be valuable inputs to local culture and community identity for the benefit of future generations.

Not only better preservation for local heritage, but meaningful adaptation of valuable elements from other cultures, is a source to enrich and diversify local cultural heritage and should be included in the preservation and protection policy.

An incorrect perception has been observed that the presence of outsiders in the area will only be negative in terms of impacts on local heritage of cultural and historical value. This is an aspect wherein the mines, through their influx management and IDP application, may become highly
9.4.7 Social and economic aspects of environmental impacts

**Risks to environmental cleanliness and safety.** The stakeholders expressed concern that the following risks may occur to environmental cleanliness and safety.

**Concern #1: Dust pollution** – Tranquillity and comfort of the living environment of herders, who camp along or in the proximity to the road, will be disrupted by dust pollution that will result from the activities of the OT and other projects and increased motor traffic.

**Concern #2: Noise** – Tranquillity and comfort of the living environment of herders, who camp along or in the proximity to the road, will be disrupted by noise that will result from the activities of the OT and other projects and increased motor traffic.

**Concern #3: Soil erosion** – Soil at the mine site will be damaged as a result of increased truck traffic and in the process of building the facilities of the OT and other projects, roads and energy transmission lines.

**Concern #4: Reduction of water resources** – Open water sources as springs, lakes and ponds may dry out and the underground water level in the water supplying wells used by herders may drop in the areas with underground water resources.

**Concern #5: Natural habitats of wildlife will change** – Wild animals will permanently desert these areas because of noise, dust and traffic.

**Concern #6: Post-closing environmental issues** – Dirt roads, open stockpiles, excavated areas will not be rehabilitated.

**Concern #7: Environmental landscape will change** – Virgin nature and environment will permanently change resulting from mining activities.

**Concern #8: The strictly protected areas will be impacted** – The road from OT to the border port of Gashuun Sukhait and the road from the Tavan Tolgoi mine to Gashuun Sukhait will pass through the “B” part of the smaller Strictly Protected Area of Gobi creating increased traffic, dust pollution, noise and population concentration.

**Concern #9: Improved solid waste management** – The amount of solid wastes will increase because of increased concentration and movement of the population. An OT report on Labour Estimate Personnel Requirements recommends reuse, reduce, recycle, landfill, land farm, waste water treatment plant as waste management policy – available at www.http://OT.mn

**POTENTIAL IMPACTS**

One of the factors that are creating direct and indirect negative impacts from the OT and other projects is the dust pollution that results from the motor traffic. Dust pollution strongly observed in the proximity to the Tavan Tolgoi coal mine site and in the areas adjacent to the road from the Tavan Tolgoi and OT mines to Gashuun Sukhait disrupts the living environment of herders camping in these areas and in their proximity and is likely to last.

The noise created by the motor traffic on the road connecting the Tavan Tolgoi mine to the border port of Gashuun Sukhait has to date negatively impacted the local herders and their herds and, in the future, the probability and intensity of such impact is likely to be high. Due to increased motor traffic and noise, wild animals will abandon their natural habitats and it is likely that in the future the possibility to return to their indigenous habitats will become limited.
The soil will be damaged in the process of building the mine facilities and roads as well as in the process of mining activities and this is a strong negative impact on the local ecosystem. In terms of water resources, there will be the following potential impacts as seen from the assessments by local residents and the results of the detailed environmental impact assessment done at the OT project.

- Reduction of underground water resources in the Gunii Khooloi
- Drying up of open water sources such as springs, lakes and ponds that accumulate in the areas near the Gunii Khooloi and Umdai River
- Depletion of the water level in the wells located in the Gunii Khooloi underground aquifer area where herders live

The Gobi Small Strictly Protected Area was established in 1996 in order to protect the Gobi ecosystem of Mongolia and the main natural habitat of *khulan*, the Mongolian wild ass. The strictly protected area consists of two parts named as “A” and “B” and covers an area of 1,839,176 hectares in the territories of the Nomgon, Bayan-Ovoo, Khanbogd soums of Umnugovi aimag and the southern part of the Khatanbulag soum of Dornogovi aimag. The area represents the main natural habitat of *khulan*, black tail antelope, Ibex and Argali sheep. About 50 percent of all *khulan* herds of our country inhabit and graze this region.

The road from OT to the border port of Gashuun Sukhait and the road from the Tavan Tolgoi mine to Gashuun Sukhait will pass through the “B” part of the smaller strictly protected area of Gobi creating increased traffic, dust pollution, noise and population concentration and the potential negative impacts will be loss and shrinkage of natural habitats forcing wild animals to permanently abandon their indigenous habitats, illegal hunting and increased solid wastes leading to environmental contamination.

**MANAGEMENT**

Within the scope of the OT Project, detailed environmental impact assessments (EIAs) were done on the following projects and the reports were approved by the Ministry of Nature and Environment.

- EIA 2004 of OT-Gashuun Sukhait road and adjacent infrastructure
- EIA 2005 of the project on use by OT of underground water resources in Galbyn Gobi and Gunii Khooloi
- EIA of the OT water supply pipeline project
- EIA 2007 of the copper and gold mining and processing project at the OT deposit
- EIA of the coal-fired power plant
- EIA 2007 of the project on moving the location of the local airport
- Report on revised and amended infrastructure assessment

The following measures for impact mitigation are included and planned for implementation in the environmental protection plan in the EIA reports listed above. For instance:

**Dust management and reduction**

- Develop and implement a management plan to reduce the amount of dust in the air
- Develop and implement an air quality control program
• Measures on road maintenance, repair, improvement and watering
  • Traffic only on permitted roads
  • Imposing speed limits
  • Construction of a paved road from OT to Gashuun Sukhait

Prevention of the underground water level reduction
• Conduct a detailed count of herders” wells in the area affected by the water level reduction and install equipment for regular monitoring
• Take measures to move the herder families and build new wells for them if the water level drops in the wells used by them, due to the depletion of the level of the shallow water-bearing seam in the process of mining
• Pay compensation to certain herders if necessary
• Drill monitoring boreholes in the Gunii Khooloi to monitor the changes in the underground water level during the mining operations
• Take and analyze samples from the used wells once a quarter
• Recycle and re-use waste water

Soil protection
• In the process of using the open mine and building the mining facilities and roads, first strip the surface soil, stockpile it and then use it for reclamation

Wildlife
• Develop and implement a wildlife management and monitoring plan

Flora
• Develop and implement a flora management and monitoring plan
• Conduct regular monitoring of the state of vegetation and changes of the plant species such as the arborescent plants growing along the riverbed of the Umdai River and arundinaceous plants growing on the river banks.

It is planned to develop and implement a “Plan for protection and monitoring of the animal species in the small strictly protected area of Gobi and in the areas in its proximity” in order to mitigate the impact on the Gobi strictly protected area.

According to the recommendation of the Integrated Development Plan, 2006, a tentative strategy for the mine reclamation in accordance with the international standards (ISO) and a mine closing plan meeting the requirement of the World Bank were developed on certain parts such as the stockpiling area, open and underground mine mouth, waste storage facility, roads and the mining village. A more comprehensive mine closure plan should be developed if and when the project goes ahead. This plan should include environmental monitoring measures.

Within the scope of the environmental control and monitoring program, since 2003 monthly checks of the water level, pH and total dissolved solids (TDS) and quarterly chemical analyses of water samples are done on six surface water points, 19 hand-operated wells and 63 boreholes.

26 Available at c:\documents and settings\davidb\desktop\financial models\idp08\report\01 executive summarydrafta djb edits clean.doc/
on the OT project area and four surface water points, 65 hand-operated wells in the Gunii Khooloi. In addition, monitoring of plant species is done on 23 areas and air measurements are performed at five points. These programs should continue and then be subsumed into the additional monitoring and management measures that will be required as and when the project commences.

9.4.8 Land, pasture and water supply

9.4.8.1 Increased degradation/pressures on natural resources

STAKEHOLDER CONCERNS

The major concerns identified by local people in terms of increased degradation of natural resources over large territorial and grazing areas in all soums in the OT Project impact area, were as follows:

Concern #1: Pastureland take – The already experienced take of pastureland will continue as additional infrastructure and other mine-related immovable facilities are built.

Concern #2: Pastureland destruction and degradation – Large grazing areas have already been irreversibly destroyed and/or degraded due to poor quality mine-built earth roads and uncontrolled traffic associated with large-scale quarrying

Concern #3: Dust-polluted pasture vegetation – Heavy trucks (more than 600 by mid-2009) generate dust that spreads over large areas on both sides of the road and pollutes the pasture vegetation

Concern #4: Damaged top and subsoils – Trucks damage fragile and lightly textured soils in the Gobi

Concern #5: Depleted underground water table – The mines’ consumption of vast quantities of underground water will lead to a steady but imperceptible depletion of the water table for both shallow and deep underground aquifers.

Concern #6: Animal health – Dust will cause temporary and long-term respiratory, optic and digestive illnesses among both domestic and wild animals.

Concern #7: Traditionally used pasture and water sources may be cut off from other sections on opposite sides of the railway and/or major truck roads – The railway could separate main camps from sources vital to pastoral herding, such as pastures and wells.

Concern #8: Physical and chemical pollution of water sources caused by sedimentary dust and spills/leakages of various chemicals and oils – Dust and other pollutants, spills/leakages of fuel and other hazardous materials and rubbish left by trucks and truck drivers may lead to cumulative impacts - chronic pollution of water sources and wells in particular.

POTENTIAL IMPACTS

Mining projects, namely, OT, Tavan Tolgoi, Ukhaa Khudag and others located in the OT Project impact area, have generated and will continue to generate significant amounts of earth dust, causing various man-made damages to natural resources. In the geographic areas affected, the damage is cumulative in nature with direct impacts that result from all activity phases at the relevant projects, but in particular, the operational phases of other projects in the OT impact area, where these impacts will be both direct and indirect.
Dust generated by and spread by heavy trucks and transporting coal from the Tavan Tolgoi area to the border point at Gashuun Sukhait and by wind has been and will remain a major concern. Unofficial sources suggest that more than 600 trucks travel on this route according to a 3-day turn-around schedule, and that this number is anticipated to increase to some 800 in a year or two. The OT Project fuel and goods transportation trucks travelling between the mine site and Choir generate dust that covers four *baghs* in the Manlai and Khanbogd *soums*.

Rough estimates suggest that dust from coal trucks travelling between Tavan Tolgoi and Gashuun Sukhait disperses over a 280 km long and 5 km wide corridor, e.g. directly affecting some 140,000 ha of pastureland making grazing potentially impossible. In terms of standard units\(^2\) used in Mongolia, 140,000 ha of pastureland supports approximately 50,000 sheep units.

Truck traffic furthermore damages top soil by eliminating grass-cover and destroying the soil’s fertile top humus layer. The area that has already been degraded by truck roads is apparently more than 700 ha in extent.

Various mining and related construction activities mobilize tremendous quantities of dust particles which may have negative impacts solely due to the particles’ physical nature, with such impacts including:

- Health impacts, such as respiratory diseases and allergies, due to airborne contaminants
- Health impacts that might result from consuming affected foods grown on such contaminated soils
- Reduction of visibility along main earth roads making traveling more unsafe
- Aesthetic impacts, such as coating buildings, vehicles, laundry, etc. with dust
- Damage to vegetation - gardens, commercial crops, vineyards, etc
- Physical damage to equipment
- Impacts on soil, water quality and aquatic life due to airborne dust

Some of these impacts may have chemical-based effects where chemical residues are present in the dust.

As a result of extended pollution/degradation to pastureland areas previously used for permanent grazing, herders are forced to find grazing by allowing their herds to graze on pastures used/possessed by neighbours or to move to other regions. All these small-scale relocations and migrations, unnoticed by outsiders, will lead to enforced re-distribution of existing grazing resources among indigenous and in-migrant herder families.

Local people perceive damage to pasture vegetation as the clearest direct negative cumulative impact from dust generation. What happens is that the dust covers plants, preventing free penetration by sunlight and absorbing the scarce, long-interval and mono-modal summer precipitation. The first to be affected are the wide-leaf varieties, followed by the fleshy-leaf plants, allowing the remaining annual undergrowth of unpalatable needle-leaf varieties to push

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\(^2\) Sheep unit is used to convert different livestock species into a standard unit based on grass intake taking 1 camel = 5.7, horse = 6.6, cattle = 6 and goat = 0.9 sheep units
all other plants out of the foliage spectrum, changing the grazing areas to non-grazing areas. It can be estimated that dust polluting 140,000 ha of pasture could destroy at least 12.8 tonne of pasture forage.

Trucks are the greatest hazard totally damaging top and subsoils. The locals describe the Gobi soil as:

- Fragilely textured easy to be trampled by the least physical actions. Truck earth roads with strong diversions degrade topsoil of large land area
- The Gobi’s fertile top layer soil is extremely thin
- Natural restoration prospects are poor once this soil has been damaged, and
- Destruction of the top layer eventually results in damaging the subsoil layers, thus increasing dust generation.

The locals commented that dust contaminates water in wells and open sources. The hand-wells (up to 90 percent of herder households in the OT Project impact area share a single well for drinking and animal water - for reference, see 13.4 in the OT Project impact area baseline subset) are usually unprotected, uncapped and poorly protected from infiltration by dust and other foreign materials. Furthermore, dust adds fine-compounded clay sedimentation to these wells, thus requiring more labour for the sediment to be removed. People and animals consuming such dust-contaminated water obviously face various health hazards.

There are big debates and expectations concerning possible division of traditional grazing areas by railway and hardtop roads. At present, during early-stage decision-making for railway routes, it is difficult to judge whether these problems anticipated by the locals will arise but, if these become a reality, quite large numbers of herder families may be affected by separation from access to traditional grazing areas and water points on opposite sides of hardtop roads and railway lines in particular. This may also add pressure on residential grazing areas and enforce re-division of pastureland among residential and affected in-migrating grazers.

Baseline air quality surveys undertaken in the OT Project impact area identified high dust levels, particularly near or along coal-carrying truck roads and in grossly disturbed areas, such as, exploration and development camps, and operating drill sites. It is noted that dust concentrations in undisturbed areas also have elevated levels due to further impacts by strong winds over the vast desert areas. Monitoring ambient dust concentrations indicated that national and international standards are regularly exceeded within and beyond the Project’s impact area28.

Water and its availability as a key resource in the Gobi is also an influential factor in pastoral living and locals commonly believe that mining will affect the availability of potable drinking and animal water. The OT Project EIA report anticipates that the water table for deep underground aquifers in Gunii Khooloi may be depleted (OT Project EIA Vol II: Water Supply from the Gunii Khooloi and Galbyn Gobi Groundwater Aquifer Areas; June 2005 EIA), by the average abstraction of 518 ℓ/s from the Gunii Khooloi aquifer with a maximum regional aquifer drawdown of approximately 75 m over the life of the Project. The assessment includes the

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average abstraction of 130 ℓ/s from the Galbyn Gobi aquifer with a maximum drawdown of approximately 10 m over the life of the operation.

The OT Project EIA report does not however confirm whether OT’s consumption of underground water will affect the level of shallow underground sources. Verbal responses (SIA team meeting with OT camp officials, 08 April 2009) confirmed that this would not happen, thus indirectly assuring that the water table depletion currently noticed by local people has been caused by global warming and lowered precipitation (for reference, see findings during 2007 water censuses\textsuperscript{29} and 13.4 in the OT Project area baseline subset). Prediction and interpretation as to whether or not shallow and deep underground water will be depleted due to OT Project consumption is complicated by currently prevailing natural factors, such as, global warming, unprecedented increases in desertification and reduced summer precipitation, all of which will potentially affect and probably reduce shallow lying sources.

Overloading coal trucks (10-20 percent above standard volumes), a major cause of constant breakdowns for these heavy vehicles, has been exacerbated by the total lack of call-out services and special off-road parking sites where broken trucks can be located for repairs and maintenance\textsuperscript{30}. At present trucks stop wherever convenient to drain oil and discard flat tires, as can be seen from oil leaks and other hazardous liquid spills over the roads and adjacent areas. An official survey dismisses that the Gobi’s arid soil is vulnerable to wind erosion following disturbances by grazing and vehicle traffic\textsuperscript{31}. Nevertheless, the loss of soil due to progressive combinative erosion results in lost vegetation diversity, altered ecological structures, and reduced pastoral productivity. Regional desertification, effects from increased vehicle traffic, and soil disturbances have also affected soil at the mine licence area.

Building a railway to connect the Tavan Tolgoi coalmine to Gashuun Sukhait has been discussed and preliminary feasibility and construction surveys are currently underway. Provided this goes ahead, the railway will be the principal means by which exported coal is forward-freighted to China. Positive impacts so far anticipated from this railway include improved environmental safety due to reduced dust generation and degradation of the fragile Gobi soil and another is the possible re-establishment of vegetation pasture and its species composition; the latter being less likely in the immediate future.

**MANAGEMENT**

For the mining projects, recognising the presence of dust-borne environmental, social, health risks and other damage to living and environmental conditions would be an important locally-welcomed attitude toward participatory risk management and problem solving. The fact that dust generation triggers a serious effect, increased by formidable cumulative impacts, challenges all projects in the OT Project impact area. Clear and feasible plans to manage the problems and associated dust-reduction will maximize efforts to remove factors leading to dust generation and

\textsuperscript{29} Water Census, Water Authority, 2007
\textsuperscript{30} Personal communication with community relations officer, Energy Resources project, April 2009
\textsuperscript{31} OT Project EIA Vol II: Water Supply from the Gunii Khooloi and Galbyn Gobi Groundwater Aquifer Areas; June 2005 EIA
its spread over the large pastoral grazing and nationally-protected natural park areas likely to be affected.

Specific objectives are to:

1. Develop a Dust Reduction Action Plan according to which all relevant parties are involved with clear tasks to be accomplished by individual arrangements and/or by cooperative arrangements. This Plan is to provide overall coordination and oversight to reduce dust emissions and spreading by trucks and other means at open coal-extraction areas, and assist to ensure that these actions are completed on time with appropriate problem solving in regard to negative impacts caused. Key requirements for such a Plan would be to note that:
   a. The predominant impacts are fairly negative and cumulative
   b. No immediate strategies have been developed to minimize dust generation
   c. Pressure is high from the locals for companies to introduce the best dust-reduction strategy supported by „live“ actions

The specific objectives of this Plan include:
   a. A significant reduction of dust generation. Grading earth-covered roads appears to be insufficient to keep dust emissions down and local communities do not accept such short-lived measures.
   b. An active search for opportunities to start building the hardtop road to connect the Tavan Tolgoi open-pit mine to the offloading depot at the Gashuun Sukhait border point.
   c. Stop diverting the main road currently being built, as its diversions not only escalate soil degradation but also seriously destroy vegetation and other eco-system elements.
   d. Reduce the spread of dust over surrounding areas. The best worldwide mine practices suggest that wetting roads is a good method to reduce both the generation and spread of dust, where other measures are either less feasible or unaffordable.

2. Develop a plan to manage increased people and livestock illnesses already diagnosed. The local perception is that, since the start of coal extraction and transportation, cases of diseases of respiratory and digestive tracts, internal and optical organs of humans and livestock have been on the rise. Although this is also a matter of social concern, eliminating factors causing such health risks should be prioritized.

This plan is to:
   a. Investigate human and livestock health disorders and diseases due to increased dust generation and other secondary effects.
   b. Recommend the best therapeutic and preventive measures in regard to health hazards, diseases and disorders.
   c. Determine the rate at which these diseases and disorders can be minimized by improving road networks and introducing effective dust suppression measures.

RESIDUAL IMPACTS

An ecosystem-based approach with emphasis on pastoral livelihoods would be appropriate to evaluate residual impacts from the OT Project on its immediate environment and the surrounding areas. The OT Project impact area is characterized entirely by its fragile environment,
accommodating large-scale pastoral livelihoods and a great assemblage of wild fauna and flora. In this context, however, any disturbance and damages brought by external non-natural factors may lead to a variety of irreversible or hard-to-restore alterations.

Similar to other parts of the Gobi’s ecosystem, the OT Project impact area has experienced ever-increasing environmental degradation during recent years, caused by negative changes in the global and regional climates, with excessive drying, diminished prospects for natural restoration, thus impoverishing resources and reducing the region’s capacity to support both people and livestock.

Given this reality, significant and persistent residual impacts associated with OT’s increased employment are anticipated during the Project’s construction and operational phases and after closure, with this also being based on a „worst-case scenario“ assuming that an extended area will be affected by the mining operations.

While operating its open-pit mines, it is anticipated that the OT Project will have added impacts on people and the environment unless appropriate measures are taken within a comprehensive risk-management program. One example of the anticipated cumulative impact from land taken to build the railway is the expected cut of approximately 1,000 ha from currently grazed pasture areas and means that impacts on land and its use will continue to be the topic of considerable concern to local communities.

As a rule, the OT Project will seek ways to minimize future negative impacts on natural resources, and strategies and action plans will be put into effect for this purpose. Wide-scale rehabilitation efforts and grassroots-based participatory management with beneficial results will help to overcome environmental and health risks.

The OT Project should make every effort to ensure that impacts will be reduced to a minimum after the construction phase and to ensure sustainable resource management after mine closure.

- Accelerate rehabilitation of the mining site and other affected land parcels
- Restore truck damaged land and pasture areas
- Restore local visual significance
- As the closure approaches, the local purchase policy may be shifted from purchasing to cooperative development

In conclusion, although the locals expect that impacts on natural resources and on the health of people’s livelihoods will definitely occur, and are highly confident that their concerns will be accepted, addressed and resolved by the mines, it will be a challenge for the mines to handle the risks associated with land/pasture damages and degradation, as well as water availability in specific parts of the OT Project impact area.

### 9.4.8.2 Land rights and pastoral communities

With regard to land rights and land use arrangements at soums in the OT Project impact area, local people raised the following concerns:
Concern #1: Rights for land-based businesses and other activities – Land take for infrastructure and other mine-related construction and operations may result in raising conflicts in regard to protecting local citizens’ rights to use, possess and own land.

Concern #2: Changed pastoral seasonal-migration routes and reduced access to seasonal pastures – The railway will cross seasonal pastures, dividing areas into extensively used and under-used, and water points may fall on opposite sides of the railway making access difficult.

Concern #3: Reduced mobility of herders: - Separating traditional or legally-allocated pasture and water from other parts may impact on the seasonal grazing mobility of herders

Concern #4: Migration of wild animals – Unending busy truck traffic and harsh noises from truck engines seem to force indigenous wildlife to migrate, leaving their habitats. It is anticipated that railway noises will add to this negative impact.

POTENTIAL IMPACTS

As mentioned above, in addition to the land taken for mine construction, development and operation, as well as the upgrade of basic infrastructure such as, the railway, hardtop roads, powerlines, etc., will result in further land-cuts from traditional grazing areas, adversely. This will affect a certain number of herding families besides reducing the overall size of pastureland. These impacts will, therefore be direct and negative.

The OT Project impact area baseline study notes that issuing certificates to herder groups and khot ails for possession of land underneath their winter and spring campsites on long-term possession and allocating seasonal pastures for long-term use has been progressing well. This means that herders in the OT Project impact area are making efforts to secure their rights to grazing and land possession and it should, thus be made clear that secured land tenure rights are a powerful tool to address any action to take land held by legal users/possessors. Throughout the Project’s impact area, this will be a high-focus point during the construction phase, when more land is expected to be taken for building of infrastructures.

Cases of major businesses in conflict over land rights are currently rare. Infrastructural developments should effect planning to prevent businesses and services heavily concentrated at soum centres becoming too large and too many. One striking comment was that people are keenly awaiting the soon-to-be-built railway hoping to occupy adjacent land and settle as shopkeepers selling products and services.

The changes that negatively shrink the availability of seasonal pasture and access to seasonal and short-term grazing areas will cause spatial alterations in the traditional pastoral migration patterns – the routes and distance. Some herders being locked by the railway would be unable to migrate frequently. Herders disconnected from water points and large grazing areas may need to move over greater distances or, conversely, over shorter distances.

Herders’ experience acquired over many years guides them to judge when and where to migrate and has become a sustainable tradition. Changing this, whether at a community level or for small groups/single households will eventually alter pastoral grazing and migration patterns. On the other hand, some herder households may become more mobile in searching for new areas
with sufficient grazing but, again, it is unlikely that increased mobility under pressure would be a positive impact.

Changed herder mobility and migration may have a compelling and unequal association with water rights – increased pressure in some parts vs. less pressure in others.

Additional land take by mining projects for purposes of future upgrading to road infrastructure will create insecurity about pastureland rights. It appears that herders in the Gobi region, and this is a reality for those in the OT Project impact area, are relatively less mobile than herders in other transhumant areas (it appears that only some 50 percent of herders migrate - see 13.1 in the OT Project impact area baseline subset). In any event, where re-division of grazing resources occurs, decreasing the availability of pastureland will force some herders to reduce their inherent mobility in the struggle for access.

In conclusion, it should be emphasized that taking pastureland would affect the resource-based viability of pastoral communities in the Gobi region with predominantly negative impacts.

As stated above, changes in herders’ mobility and grazing migration patterns may create a situation wherein their neighbours may pressurize immobile herders evidently degrading pastures by overgrazing but it is difficult to judge whether or not all will behave and respond positively.

Soum and bagh governments, seriously criticized for their poor intervention to settle disputes over the use of pasture and water resources, may recognize the need to improve their roles to manage natural resources better, as well as to secure land tenure rights.

MANAGEMENT

Since the areas potentially to be affected by land takes are either located in a long corridor across all four soums or randomly and mostly around the mine sites, it is likely that all soums will not act simultaneously and in accord to effectively resolve cases as a single body responsible for land matters. For the same reason, there is little probability that the mining projects alone will be able to do so as they cannot directly intervene in land-related and land-management matters. The only option for the mines is, therefore, consultation with local stakeholders at two levels: the soum governments as the owner’s (namely, the State) legal representative, and the herders holding informal and formal grazing rights.

The first thing the projects might do is prepare a comprehensive Resettlement Plan so that all potential cases of relocation for herder households and other land-based properties receive oversight and the planning process should be participatory and interactive.

The specific objectives in the Resettlement Plan would be:
   a. Recognize local citizens as exclusive user-rights holders
   b. Ensure that a common resettlement policy is applied at all projects: OT, Tavan Tolgoi, Ukhaa Khudag, etc.
   c. Insert special clauses for the oversight of livestock relocation where this falls into the railway and hardtop road infrastructure and protection areas
d. Provide compensation for any losses incurred and cover additional costs associated with moving shelters/buildings or properties from one side of the railway and/or hardtop road to the other.
e. Respond to and settle claims associated with the loss of access to water points.
f. Include measures to avoid discrimination between affected parties.

Timely and responsible settlement of disputes associated with resettlement/relocation and user rights for natural resources requires special attention as the dispute instigators and parties involved therein may differ, and these should be addressed by:

a. Negotiations between residents and newly-arrived relocated herders/citizens
b. Negotiations between the projects and those claiming for relocation
c. Negotiations between property owners and the projects where the latter have initiated resettlements
d. Identify cases motivated by speculation when land is being allocated for ownership and/or possession by users, including pastureland and plots to build or rehabilitate wells

RESIDUAL IMPACTS

All stakeholders are aware that obtaining land by cuts from *soum* land resources, including pastureland, as needed for exploration, construction and operations, is a core requirement for the mines and, according to existing laws, the mines will not face critical problems.

In areas where pastoral production systems need vast grassland territories to sustain grazing at normal levels, both the grasslands’ size and productivity are important survival factors. It can, therefore, be clearly seen that land is vitally important for pastoral communities with their livestock as a livelihood resource. In this respect, two main issues need to be taken into consideration by the mining projects and the local communities.

Firstly, the mining projects are a vital source for local development and livelihoods and will significantly help local people to improve their living standards by benefiting from various opportunities. In this sense, the locals should become reliable partners to the projects.

The mining projects should be well aware that any decrease in the size of grazing land for any reasons that cause irreversible loss or degradation will threaten pastoralists’ interests. The locals argue that land taken for various mining needs will not be returned to its original designation, and that no restoration methods adaptable to the Gobi region are available.

The rate of land take is likely to be commensurate with the mining project phases, decreasing after starting the operational phase and ceasing after closure, thereby steadily reducing pressures on land.

Secondly, the effective rehabilitation of land damaged and/or degraded due to these projects and mining operations is obligatory and must be initiated as the project phases advance according to dimensions and scope.
The projects will also continue to provide donations to mitigate the effects of and hardships caused by climatic disasters as goodwill responses to support pastoral herders’ needs for livestock feed and shortages of other pastoral inputs.

The vital condition for pastoralism to exist is open grazing over vast pasture areas. In this respect, any reduction in the size of pastureland and forage resources associated with mine development will be a permanent and adverse impact.

9.4.9 Government services, safety/crime infiltration and resettlement

9.4.9.1 Government services and governance to enable better participation by local stakeholders

Issues related to Government services, safety/crime infiltration and resettlement at the soums in OT Project impact area and recognized by the locals as concerns, are as follows:

**Concern #1: Roles and participation for local citizens, entities and other stakeholders in good governance** – Stakeholders in the survey areas continuously talk and complain about the need to improve the host soum government’s role in implementing the mining projects. No participatory approach however is in place wherein all stakeholders are involved to assess, monitor and manage this issue. Local NGOs and interest groups are not actively involved in environmental protection and effective monitoring.

**Concern #2: Burden to manage normal soum public service functions** – Increased out-migration of families and citizens from some soums, for example, the Manlai and Bayan-Ovoo soums, may result in cutting soum budgets and reducing local government staff during future years, making it more difficult for soum governments to maintain their functions and provide better services.

**POTENTIAL IMPACTS**

To start with, it should be highlighted that the OT Project policies and action plans are expected to have positive impacts on soum government function and on local stakeholders’ contributions to implement the Project.

The need for local participation in economic and social actions and governance is recognized in many strategic and policy statements at all Government levels, on the one hand, and by the OT and other mine projects, on the other. As found during the field survey, local stakeholders have mixed intentions – greater appreciation vs. unhappiness among those worst affected. This situation may provide good opportunities: (i) to understand why these two extremes are present, (ii) how this factor could be used to maximize positive effects, and (iii) draw up an effective and mutually-beneficial participation scheme to ensure wider involvement in governance for local stakeholders in both local administration and the mines’ actions.

An associated target will be to restrict fly in and fly out (FIFO) employment to a maximum of 20 percent of the total workforce see footnote 31. Relocation will be required for targeted members of the workforce currently employed on a FIFO basis, and increased use of local commuting („bus-in, bus-out – BIBO”), plus the engagement of further short-term locally based contractors will commence after 2012. Recruitment of suitable targeted local employees will
occur throughout this period and, at the same time, active programs to recruit and train local people will occur to ensure that OT”s targets are met.

Measures and actions as cited above to be implemented within this umbrella policy will have the most satisfactory positive impacts by removing concerns about potential depopulation threats at some *soums* (reduced resident population due to out-migrations) that have been widespread and discussed during the fieldwork and community consultation workshops.

Localization of OT Project workers at all five *soums* in its impact area should be accepted as a favourable good-will policy on OT”s side. Regardless of some undesirable outcomes predicted by the locals, good relationships will be forged among the citizens. More importantly, *soum* governments would be given a greater chance to sustain their functions and maintain the *soums’* unity.

Thanks to this policy, *soums* with firmly-embedded concerns about reduced population sizes and disturbed government functions may now seriously think about welcoming and absorbing the forthcoming population pressures in terms of good governance and extended community participation in *soum* developments. This may require making it clear that the demands and tastes of mineworkers” family members, in terms of attitudes towards governance, quality and capacities in other public services, may not necessarily be similar to those of *soum* natives and, owing to this, the immediate challenges for local governments may be to be more open, more responsive and more participatory.

The existence of less responsible mining activities (large coal mining) that have created major negative impacts, and the informal networks, such as undermining locals and some corruption may be an indication of possible local governance shortcomings. To enable *soum* governments to be more efficient in the services they provide, the locals need to become organized. The present inactive local NGOs and interest groups will not be of any help to the *soums* and mines. Poorly functioning NGOs that encourage negative emotions may counteract local interests in supporting the mines” efforts to trigger local well-being.

From the OT Influx Risk Assessment32, it follows that governance risks arising from increased local government revenue flows with weak controls, or from pressures for local government officials to accept informal payments to facilitate registration of newcomers, allocate land or provide preferential access to project employment may lead to:

- Service providers may undermine local governance in order to secure „licenses” to operate
- Increased crime/breakdown of law and order creates challenges for the Government.
- Increased pressure on local government officials to accept informal payments to facilitate access to land, jobs, and the like
- Probable erosion of good governance and undermining of Government authority and public distrust
- Reputation risk to IMMI by association.

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MANAGEMENT

It is clear that neither the mines nor the soums’ actions will be successful unless effective local participation is secured for all legal and organizational arrangements. FGDs and surveys revealed that local communities poorly understand that the soum authorities are the bodies that ensure good governance towards better cooperation with the mines and this lack of understanding appears to contribute to ineffective relations between the communities and the mines. One problem is that the soum governments’ support for community groups, associations, NGOs and other interest groups is almost non-existent which does not encourage them to be active. A further contributing factor is that the NGOs and groups, such as the elders’, youths’, women’s associations and Red Cross initiatives are completely inactive in leading local communities to prosperous future local development in cooperation with the mines.

Local authorities may be involved in good governance and play better roles in mine operations as representatives for local communities and as cooperating partners. On the mine’s side, the best option would be to ensure the continuation of a comprehensive communications program. The Company has already invested considerable efforts into communicating and engaging with its stakeholders, and should be encouraged to continue and even enhance these activities, covering the principles outlined below.

The requirements for an effective Comprehensive Communications Program are:

1. Institutionalize community consultation as an integral part of mine management’s strategy and policy
2. Create viable mechanisms to ensure public and community inclusion in decision-making processes on matters of cooperation and communication with the mines
3. Create a working environment that is effective for not only information networking but also for managing other social affairs among the local and mine communities

The specific objectives of this Program, to be designed and implemented jointly by mine and local government, citizens and civil society institutions, may include:

- Ensure transparency and public disclosure of all payments made to local and higher levels at soum governments
- Ensure that all Project personnel and contractors are aware of the OT codes of conduct pertaining to dealings with third parties
- Provide training and capacity building for soum government officials in good governance, revenue management, fiscal accountability and transparency
- Introduce better organization to manage pressures on personnel in charge of public welfare, taxation, social affairs, law and order, etc.
- Provide support to re-equip soum government officials with working and office facilities.

9.4.9.2 Resettlement and related burdens

The OT Project has provided a good example of correctly managing resettlement for affected households by undertaking the relocation of 11 herder households and these beneficiaries are completely satisfied with OT Project responses to their needs and burdens associated with
resettlement. However, it has been advised that the coal mines, especially the Ukhaa Khudag mine, have had problems to resolve these issues as herder households in the host area/s are unwilling to accept the people being resettled.

**Concern #1 Further resettlements forced by land taking for large infrastructures** – As reliable transportation, energy and water supply networks are keys to successful mining more land will be needed for future upgrades. The mines plan to build large structures, such as, railways, further improved roads and water pipelines, all of which will need more land to be taken, including from pasture camps, wells and other land-based properties used by herders. From a practical point of view, additional migration of herder households because of mine impacts, such as dust, water and access issues, could be treated as resettlement as they are either to leave behind or take all their properties and belongings with them to wherever they will resettle. It shows that the herder households seem to move to new areas to live permanently.

**Concern #2: Giving up herding as a dilemma**– The mines will create jobs that people may take. Inherently, herding and part-time non-herding jobs are totally incompatible and, in order to be engaged in permanent jobs, herders may be forced to give up herding. Thus, employment at mines may result in herders facing difficult choices between herding or voluntary resettlement to be employed by the mines.

**Concern #3: Diluted commitments by and opportunities for those who give up herding** – Hiring local people, including herders (whoever satisfies the requirements) will be the mines’ key employment policy, but touches the most fragile issues of livestock production and rural livelihoods, and returning to herding after leaving the mines may no longer be considered an alternative.

**Concern #4: False claims for resettlement** – Local people and pastoralists complain that, as dust and other negative effects have been unacceptably high, they have been unable to remain at their present locations, but some false claims may be made in this regard.

**Concern #5: Resettlement or relocations may overburden those being resettled** – The locals believe that unforeseen resettlements and relocations will continue, as building the railway was never previously envisaged and in such uncertain situations, moving properties and belongings will require additional resources from the owners during and after resettlement. There is a concern that these burdens may not be accepted and reimbursed by the mines.

**POTENTIAL IMPACTS**

Throughout the whole OT Project impact area, resettlements only involve herder households and the locals recommend that the mines understand what resettlement really means for these households. According to local views, the differences between resettling urban households and resettling herder households are:

1. Herder households desperately need all structures and facilities for their households and livestock farming to be re-built (i.e. not just human dwellings)
2. To be resettled, urban households may need, as expressed during FGDs, to move the house/enclosure and other simple facilities „from one corner to another”
3. To be resettled, herder households, by contrast, need to shift everything from one place to another over a long distance and to secure access to pasture and other grazing resources, including water sources and, in this regard, the operational and tactical involvement of soum authorities is essential
4. Resettled herder households need to reach long-term consensus with herders in the host area/s to which they are moved.
The above-listed elements may be treated as basic requirements for herder household resettlements and, where one of these elements is missed or not completed, the resettlement is unfinished.

In addition to physically relocating people and their properties, social impacts involve meanings, perceptions, or the social significance of changes effected by the mining operations.

The locals complain that speaking to the soum government has not been helpful to reach consensus with the mines to reduce already emerging impacts from dust generation and damages to the ecosystem. In the end, this may lead to a situation where the locals may trust the soum administration less in its role to defend their interests. When such situations arise, the mines need to take effective intervention actions. As shown during the field survey, resettlement by nature is a process involving three legal parties: households as the affected parties, mines as the affecting parties, and the soum administration as the governing body.

Other key issues of concern to the locals are:
1. The elderly have been identified as a category of persons sensitive to involuntary displacement and relocation
2. Ensure that resettlement/relocation will occur after full, advance consultation and specific planning
3. Households, especially herder households, to be resettled may contend for better pasture areas in terms of grazing resources and proximity to access major services and facilities. In other words, they may try to take full advantage of resettlement to “improve their lives”, and problems may thus appear for the Project and soum authorities to keep up with demands from affected households.

MANAGEMENT

A formal grievance system is a requirement within the IFC Performance Standard 5 Land Acquisition and Resettlement regulations. Resettlement planning as applied to relocating households within the mine license area should therefore, be updated to include a confidential system of grievance management for impacted local people.

A dilemma for the mines is managing necessary resettlements and avoiding unnecessary resettlement.

The Law of Mongolia on Minerals calls for full compensation for damages caused by exploration or mining activities to owners of dwellings, wells, animal shelters and other structures (Article 32). License holders are also required to cover relocation costs, and consult and coordinate their activities with local administrative bodies in regard to infrastructure and employment developments (Article 33). The Mining Office, as one of the agencies responsible to implement mineral-related legislation, undertakes research, evaluations, and formulates recommendations

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with respect to the mining industry’s impact on social and economic development in Mongolia (Article 57), and necessary resettlements must comply fully with the Minerals Law.

As far as unnecessary resettlements are concerned, exclusion zone distances may be required to be set based on accurate surveys and consultations with local authorities. International standards (such as IFC’s Social and Environmental Sustainability Performance Standard 5), generally emphasize the need to minimize project footprints, including areas subject to use restrictions, so as to avoid unnecessary livelihood displacements for existing users. In order to comply with international standards, it is recommended that IMMI reviews and develops clear and defensible criteria to set the extent of exclusion zones so as to: (i) accommodate the mine’s operational requirements; (ii) ensure health and safety for surrounding users and their livestock; and, (iii) minimize displacements for adjacent business activities.

As far as possible, it is recommended that IMMI should seek to accommodate customary use of exclusion zones for summer grazing, as regulated use may reduce the risk of outsiders occupying such land. By accommodating ongoing grazing, the Project will also avoid unnecessary livelihood displacement and obligations to develop compensatory measures.

As there is no guarantee that other livestock owners will not in-migrate to affected areas, the soum government may be challenged to manage such influx, if occurs.

Involuntary or unnecessary resettlements may cause long-term hardships, impoverishment, social dislocation and environmental damage unless appropriate measures are carefully planned and carried out. Where required, resettlement activities are be undertaken within a sustainable program wherein resettled households are assisted in their efforts to improve their livelihoods and standards of living, or at least be restored to pre-displacement levels.

Reviewing the existing Resettlement Policy and related program may therefore, be required and should include:

- Review and redesign exclusion zones around the OT Project mine site and in areas where new and additional infrastructures are to be built
- Manage household relocations in regard to cumulative impacts, e.g. draw up resettlement procedures and arrangements in common with other mines, so that affected households considering resettlement are treated equally
  - Ensure access for customary grazers to pastures within the exclusion zones
  - Ensure equal treatment for those to be relocated beyond the mine site and those affected by off-site mine infrastructures and constructions

Appropriate management of compensation issues is crucial and, in this context, the main requirement is to properly identify and compensate communities and/or individuals being disadvantaged by a project. A good compensation process is defined by its ability to identify the rightful recipients of compensation and quantify actual loss values.34

Issues to improve opportunities and compensation include:

34 Community Relations Diagnostic Workshop, Oyu Tolgoi, Mongolia, May 2008
• Establish formal grievance mechanisms that are responsive and efficient.
• Review and handle compliance on resettlement in cooperation with soum authorities.
• Review resettlement agreements with herder households so that all those affected receive equal opportunities
• Revise the criteria for resettlement
• Review and audit methods used during herder resettlements
• Incorporate newly-learned lessons in the revised criteria and approach
• Identify situations likely to require compensation (i.e. not limited to resettlement: roads, livestock accidents, pasture impacts, etc.)
• Incorporate resettlement into community relations in order to exercise day-to-day management activities, including business plans, strategies and management systems.

9.4.9.3 Crime infiltration and safety

In the opinion of local residents, crimes and violations of laws, orders and other social norms have been rising and they tend to link these with increased in-migration by outsiders from other parts of the country and the aimag, including arrivals from China.

Concern #1: Increased crime and violations – The mines will generate employment for many workers, including some ill-behaved and antisocial individuals.

Concern #2: Increased drinking – Increased disposable income earned by employees may be spent in socially undesirable ways, for example drinking that, in turn, may encourage and increase alcoholism.

Concern #3: Increased gambling – The mines will generate employment and encourage economic activities that may lead to higher disposable incomes that, in turn, may increase various antisocial pastimes, including gambling.

POTENTIAL IMPACTS

Although drinking is common among the local resident population, there is a concern that it will increase due to increased influx and concentration of people in fewer settlements, e.g. soums centres. Police have reported a significant rise in crime and traffic accidents. Criminal convictions in the Project area soums rose from 9 in 2005 to 46 in 2007, an increase of more than 500 percent. Increased crime is attributed by the police to the large number of itinerant informal miners passing through the soum on their way to work at Iraq Hill, about 130 km south-west of Khanbogd soum centre. According to the police, incidents involving drinking, fighting and motor vehicles predominate. While police were clear that they did not attribute the increase in crime in any way to the OT Project or its employees, such incidents are commonly associated with construction-related influx.

Law and order impacts caused by population influx may include:
• Breakdown of law and order – increased crime and illicit activities
• Single workers can cause social problems in family settings – drinking, gambling, fighting, petty crime, etc.
• Presence of mine workers and their families may contribute to the spread of other social ills (prostitution, alcoholism and STIs)
• Herders are worried about the increased theft of livestock and properties
MANAGEMENT

In view of the evident increase in crime and violations, as well as immoral social behaviour, the OT Project management is requested to endorse and implement an effective Crime Management Program, in co-operation with local authorities.

It may be worth noting that the OT Project should work with soum leaders to consider two main aspects to manage crime and other socially offensive affairs:

1. Review and monitor the number of criminal convictions at surrounding soums as an influx management indicator.
2. Determine whether recruitment has failed to obtain criminal clearances or follow-up on criminal records where crimes may affect the community, or where they may affect the applicant’s chances for employment.

The main and specific objectives of a Crime Management Program may include:

- Strong recruitment policies and procedures to prevent legally-convicted and socially ill-behaved individuals being recruited
- Better cooperation with and support to soum police
- Increased social pressures by mine worker groups on those behaving inappropriately
- Day-to-day information exchanges and networking with other mines on criminal and law breaking affairs and ways to settle these
- Cooperative monitoring crime incidences and violations as part of OT Project social impact monitoring
- Coordinate with police to provide additional resources when warranted
- Manage social dislocation - breakdowns of traditional values, networks and social safety nets - that can contribute to increased alcoholism, domestic violence, etc.
- Plan and implement community safeguards against:
  - increased road accidents and fatalities; poor relations within communities
  - illegal and highly-demanding blockages and stoppages by the locals and others
- Provide road safety and safety awareness training at local schools
- Provide driver training and skills development.
## 9.5 OT IMPACT ASSESSMENT MATRIX

### 9.5.1 Local economy, local business development and infrastructure

<table>
<thead>
<tr>
<th>Potential Impacts/Issues</th>
<th>Causes</th>
<th>Nature</th>
<th>Geographic Extent</th>
<th>Duration</th>
<th>Magnitude</th>
<th>Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Increased pressure on existing infrastructure</td>
<td>Population growth supported by growth of local population and influx</td>
<td>Cumulative, and negative</td>
<td>OT Project impact area and other project areas</td>
<td>Construction and operational phases and after closure</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>2. Limited availability of mine-supported infrastructure and services for herders</td>
<td>Basic energy, water and communication infrastructure are planned only for soum centres and mine camps, and other small settlements to be built at later stages. No direct access for herders is considered</td>
<td>Indirect negative</td>
<td>Areas adjacent to where such infrastructures will be built</td>
<td>Construction and operational phases</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>3. Increased costs for infrastructure maintenance after mine closure</td>
<td>These mines are the largest of their kind in the world and require high capacity infrastructures. Maintaining such capacities will be costly</td>
<td>Cumulative, and negative</td>
<td>Areas where such infrastructures exist</td>
<td>Final stage of operational phase and after mine closure</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Local business development</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4. Increased business competition</td>
<td>Increased business competition for highly concentrated markets with specific demands and consumption patterns</td>
<td>Cumulative positive</td>
<td>OT Project impact area</td>
<td>Throughout the life of mine</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>5. Improved sensitivity, flexibility and responsiveness by local businesses to market affairs</td>
<td>The range of demands at these large mines will encourage local businesses to respond with diversification and better performance</td>
<td>Positive direct</td>
<td>OT Project impact area</td>
<td>Throughout the life of mine</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>6. Destabilizing local businesses</td>
<td>All types of local businesses may not benefit equally from deals with the mines and some types, especially</td>
<td>Indirect negative</td>
<td>OT Project impact area</td>
<td>Permanent</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Potential Impacts/Issues</td>
<td>Causes</td>
<td>Nature</td>
<td>Geographic Extent</td>
<td>Duration</td>
<td>Magnitude</td>
<td>Likelihood</td>
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<tr>
<td>small shops and services, may be destabilized</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>7. Improved segmentation and protection of local markets</td>
<td>Growth and diversified local businesses become more powerful to retain market segments</td>
<td>Direct Positive</td>
<td>OT Project impact area</td>
<td>Permanent</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>8. Poor community trust towards mine contributions to local budgets</td>
<td>● Local people poorly trust the governments in distribution of contribution paid by OT  ● Local government is less transparent and accountable to both the contributor and the locals</td>
<td>Direct negative</td>
<td>OT Project impact area</td>
<td>Throughout the life of mine</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

**Local economic development**

| 9. Increased local budget revenues | Project contributes to local budget revenues through taxation, fees and grants/endowments | Cumulative, and positive | OT Project impact area and other project areas | Permanent with a rise during operational phase | High | High |
| 10. Poor community trust toward contributions to local budgets | ● Poor absorption and less transparent contribution management by soum administration  ● Poor management of community expectations from increased budget | Indirect negative | OT Project impact area | Not related to the mine development | Moderate | High |
| 11. Improved local cash retention and sustained cash flows | ● Increased employment and income will result in increased saving  ● Banks more willing to lend for lower collateral requirements | Cumulative, indirect and positive | OT Project impact area and other project areas | Construction and operational phases | High | High |

**Social structures and relations**

| 12. Emergence of an aristocratically mannered social layer | Widened gaps in wealth status | Indirect negative | Undeterminable | Long-term, while wealth resource continues | Moderate | High |
| 13. Improved social relations | ● Infusion of good examples and intelligent social relations | Indirect positive | Undeterminable | Permanent | Moderate | Moderate |
### Potential Impacts/Issues

| 14. Changes in family well-being and life affairs | Alterations in employment and household livelihoods and life-cycles (working long shifts and changed attitudes to and care for household life, children, etc.) | Direct/indirect and negative. | Undeterminable | Throughout life of mine but may become permanent | High | Moderate |

| 15. Phenomenon „rural to soum centre migration” | Over-concentration of people at soum centres | Indirect negative | Soums in OT Project impact area | Long-term, but reverse migration may occur by late operational and closure phases | Moderate | High |

### 9.5.2 Population

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Causes</th>
<th>Nature</th>
<th>Geographic extent</th>
<th>Duration</th>
<th>Magnitude</th>
<th>Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Increased population growth</td>
<td>In-migration by job seekers and workers due to employment creation and service industries development, hiring locals and outsiders</td>
<td>Direct positive/ Negative</td>
<td>OT Project impact area</td>
<td>Construction, operational, and closure phases</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>2. Changed population gender composition</td>
<td>Changes in the gender ratio will be seen as a result of gender-preference employment</td>
<td>Direct Negative</td>
<td>OT Project impact area</td>
<td>Construction and operational phases</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>3. Changed family formation and wellbeing</td>
<td>OT Project’s work strategies, New residential patterns</td>
<td>Direct Negative</td>
<td>OT Project impact area</td>
<td>Construction, operational and closure phases</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
</tbody>
</table>
### 9.5.3 Employment

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Causes</th>
<th>Nature</th>
<th>Geographic extent</th>
<th>Duration</th>
<th>Magnitude</th>
<th>Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Increased employment for locals</td>
<td>Hiring locals for permanent jobs</td>
<td>Direct</td>
<td>OT Project impact area</td>
<td>Construction and operational phases</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Employment of local people associated with the OT Project and subsequent increases in cash income</td>
<td>Direct</td>
<td>OT Project impact area</td>
<td>Construction and operational phases</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>3. Skills development for locals</td>
<td>Locals have high expectations of employment. However, their skills do not fully meet requirements. Training will increase skills.</td>
<td>Direct</td>
<td>OT Project impact area</td>
<td>Operational and closure phases</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>4. Raising job performance quality</td>
<td>Exposure of local workers to higher and international standards of work will raise performance levels.</td>
<td>Direct</td>
<td>OT Project impact area</td>
<td>Construction, operational and closure phases</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>5. Increased employment for expatriates</td>
<td>Hiring skilled expatriates</td>
<td>Indirect</td>
<td>OT Project impact area</td>
<td>Construction and operational phases</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>6. Indirect employment</td>
<td>Additional employment of local people</td>
<td>Indirect</td>
<td>OT Project impact area</td>
<td>Construction and operational phases</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>7. Conflicts between locals and outsiders</td>
<td>Access to Project–related employment, population growth and perceptions of imbalances between benefits and impacts</td>
<td>Direct</td>
<td>OT Project impact area</td>
<td>Construction and operational phases</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>8. Gender impact on workforce participation</td>
<td>Mining employment tends to favour males thus limiting opportunities for women to obtain jobs</td>
<td>Indirect</td>
<td>OT Project impact area</td>
<td>Construction and operational phases</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

### 9.5.4 Health and safety

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Causes</th>
<th>Nature</th>
<th>Geographic extent</th>
<th>Duration</th>
<th>Magnitude</th>
<th>Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reduced access to</td>
<td>Population density and in-migration</td>
<td>Direct</td>
<td>OT Project impact area</td>
<td>Construction and</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
</tbody>
</table>
and range of health care services process will be increased Negative area operational phases

| 2. RH access and FP services and their quality | Reproductive-aged foreign and local workforce will be increased | Indirect Negative | OT Project impact area | Construction and operational phases | Moderate | High |

| 3. Living environment changes cause health issues | Increased vehicle movements, reduced drinking water, increased noise, emissions, dust and air pollution will be major problems | Indirect Negative | OT Project impact area | Exploration, construction, operational and closure phases | High | High |

| 4. Impacts on food safety | Failure of current food supply system to ensure quality and safety food demands | Direct Negative | OT Project impact area | Exploration, construction, operational and closure phases | High | High |

9.5.5 Education

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Causes</th>
<th>Nature</th>
<th>Geographic extent</th>
<th>Duration</th>
<th>Magnitude</th>
<th>Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pressure on facilities, services and infrastructure at kindergartens and schools (and dormitories)</td>
<td>In-migration will be the main cause</td>
<td>Direct Negative</td>
<td>OT Project impact area</td>
<td>Construction and operational phases</td>
<td>Moderate</td>
<td>High</td>
</tr>
</tbody>
</table>

| 2. Expanded skills base: Increased population with professional/higher education | Professional workers migration Action Plan includes provisions to enhance locally available skills | Direct Positive | OT Project impact area | Construction and operational phases | Moderate | High |

| 3. School drop-out levels | ● Control over children will be weakened by families being transferred to work at the OT Project and children will leave school ● Children from herder families will leave school to herd livestock for their families and other families in order to earn money ● Children moved to other places | Indirect Negative | OT Project impact area | Construction and operational phases | Low | Moderate |
4. Shortage of professional degreed teachers
- School and kindergarten teachers will be interested to find well-paid jobs at mining companies
- Schools left with fewer children due to movement will have lower budgets

<table>
<thead>
<tr>
<th>Potential impacts/Issues</th>
<th>Causes</th>
<th>Nature</th>
<th>Geographic Extent</th>
<th>Duration</th>
<th>Magnitude</th>
<th>Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased disturbance of significant paleontological and archaeological objects</td>
<td>Employment, migration and population growth</td>
<td>Indirect, negative</td>
<td>OT Project impact area</td>
<td>Life of project</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Changed local traditional customs and responses</td>
<td>Population growth and representations of different regional cultures, local routines, customs and rituals</td>
<td>Cumulative and indirect</td>
<td>OT Project impact area and other project areas</td>
<td>Life of project and beyond</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Better conditions for preservation and protection of cultural heritage</td>
<td>Expectations by local community to introduce better preservation and protection for local cultural heritages</td>
<td>Direct, positive</td>
<td>OT Project impact area</td>
<td>Life of project and beyond</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Lost and changed local cultural identity</td>
<td>Mix of different cultures and loss of local cultural identity.</td>
<td>Negative, cumulative</td>
<td>OT Project impact area and other project areas</td>
<td>Life of project and beyond</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

5. More opportunities to reach adequate levels of professional teachers
- Increased budget and finance by increasing their number of children

<table>
<thead>
<tr>
<th>Potential impacts/Issues</th>
<th>Causes</th>
<th>Nature</th>
<th>Geographic Extent</th>
<th>Duration</th>
<th>Magnitude</th>
<th>Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased budget and finance by increasing their number of children</td>
<td>Direct, positive</td>
<td>OT Project impact area</td>
<td>Construction and operational phases</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

9.5.6 Cultural heritage
9.5.7 Socio-economic aspects of environmental impacts

<table>
<thead>
<tr>
<th>POTENTIAL IMPACTS/ISSUES</th>
<th>Causes</th>
<th>Nature</th>
<th>Geographic Extent</th>
<th>Duration</th>
<th>Magnitude</th>
<th>Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dust pollution</td>
<td>OT and Tavan Tolgoi project related traffic/activities</td>
<td>Cumulative and negative</td>
<td>OT Project impact area and other project areas</td>
<td>Construction, operational and closure phases</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>2. Noise nuisance</td>
<td>OT and Tavan Tolgoi project related traffic/activities</td>
<td>Cumulative and negative</td>
<td>OT Project impact area and other project areas</td>
<td>Construction, operational and closure phases</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>3. Traffic accidents and injuries</td>
<td>OT and Tavan Tolgoi project related traffic</td>
<td>Cumulative and negative</td>
<td>OT Project impact area and other project areas</td>
<td>Construction, operational and closure phases</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>4. Degraded soil</td>
<td>OT and Tavan Tolgoi project related traffic/activities</td>
<td>Cumulative and negative</td>
<td>OT Project impact area and other project areas</td>
<td>Construction phase</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>5. Depleted underground water level</td>
<td>Project water usage</td>
<td>Direct, negative</td>
<td>OT Project impact area</td>
<td>Operational phase</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>6. Vegetation clearance</td>
<td>OT and Tavan Tolgoi project related traffic/activities</td>
<td>Cumulative and negative</td>
<td>OT Project impact area</td>
<td>Construction and operational phases</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>7. Visual impact</td>
<td>Project buildings and infrastructure</td>
<td>Direct, negative</td>
<td>OT Project impact area</td>
<td>Construction, operational and closure phases</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>8. Migrated wildlife and unoccupied habitat areas</td>
<td>OT and Tavan Tolgoi project related traffic/activities</td>
<td>Direct, cumulative and negative</td>
<td>OT Project impact area and Strictly Protected Area in particular</td>
<td>Construction, operational and closure phases</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>9. Solid waste</td>
<td>Increased population growth in OT and other mine areas More settlement with more waste to handle Poor local capacity to recycle or process solid waste</td>
<td>Cumulative and negative</td>
<td>OT Project impact area</td>
<td>Construction, operational and closure phases</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>10. Impacts on Strictly protected areas</td>
<td>Dust, noise and other factors that are sensitive to wildlife and other components of the strictly protected areas</td>
<td>Cumulative and direct</td>
<td>OT Project impact area and Strictly Protected Area in particular</td>
<td>Construction, operational and closure phases</td>
<td>Moderate</td>
<td>High</td>
</tr>
</tbody>
</table>
9.5.8 Land, pasture, water, local supply capacities

<table>
<thead>
<tr>
<th>POTENTIAL IMPACTS/ISSUES</th>
<th>CAUSES</th>
<th>NATURE</th>
<th>GEOGRAPHIC EXTENT</th>
<th>DURATION</th>
<th>MAGNITUDE</th>
<th>LIKELIHOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Loss of land</td>
<td>Alienation of land and pastureland associated with construction and operational phases at mine</td>
<td>Direct, cumulative and negative</td>
<td>OT Project impact area, 15 baghs in 4 soums in particular and other project areas</td>
<td>Throughout construction and operational phases</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>2. Pastureland degradation and desertification</td>
<td>Transportation and other operations associated with construction and operations</td>
<td>Direct, cumulative and negative</td>
<td>Grazing areas along truck roads and mine infrastructure</td>
<td>Permanent and poorly reversible</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>3. Dust polluted pasture vegetation</td>
<td>Activities and other operations associated with OT and other mine construction and operations that generate and spread dust and damage pastureland soils</td>
<td>Direct, cumulative and negative</td>
<td>Areas along coal truck and goods transportation roads and increased truck areas</td>
<td>Until dust-free transportation, e.g. hardtop roads and railways become fully usable</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>4. Domestic and wild animal health</td>
<td>Sickness and chronic disorders caused by inhaling dust, breathing dust-contaminated air, and consuming dust-polluted grass and water</td>
<td>Direct, cumulative and negative</td>
<td>In dust-polluted areas in the OT Project impact area and other project areas</td>
<td>Until dust-free transportation, e.g. hardtop roads and railways become fully usable, and thereafter</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>5. Traditionally used pasture divided and users may be separated from water sources</td>
<td>In areas through which long and busy truck roads, railways and water pipelines pass</td>
<td>Direct, cumulative and negative</td>
<td>OT Project impact area and other project areas</td>
<td>Throughout life of mine</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>6. Changed pastoral seasonal migration routes</td>
<td>Seasonal migration of herds is a key resource management tool. The Project will trigger changes in traditional seasonal migration routes and distances</td>
<td>Direct negative cumulative</td>
<td>In areas where railways, main roads and other mining facilities are built</td>
<td>During construction and operational phases</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>7. Reduced mobility for herders.</td>
<td>Increased distances for seasonal migration will force poor and vulnerable herders to stay longer at one camp or half of their</td>
<td>Direct negative</td>
<td>In areas where railways, main roads and other mining facilities are built</td>
<td>Throughout life of mine</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>POTENTIAL IMPACTS/ISSUES</td>
<td>CAUSES</td>
<td>NATURE</td>
<td>GEOGRAPHIC EXTENT</td>
<td>DURATION</td>
<td>MAGNITUDE</td>
<td>LIKELIHOOD</td>
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<td>normal migration time</td>
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<tr>
<td>8. Land rights for land-based businesses and other activities</td>
<td>Land takes and resettlements may cause land right disputes</td>
<td>Direct negative</td>
<td>OT Project impact area</td>
<td>Construction phase</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>9. Resettlement of indigenous households and poorly managed immigration policy by both the soum and mines will cause problems with land allocations</td>
<td>Unwelcoming attitudes in regard to land and grazing area allocations for resettled and in-migrating households</td>
<td>Direct negative</td>
<td>In areas surrounding mine site, large constructions and soum centres</td>
<td>Construction and operational phases</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>10. Physical and chemical pollution of water sources caused by sedimentary dust and various chemicals and oil leakages</td>
<td>Dust and various pollutants left by trucks near to wells and using unhygienic vessels to lift water heavily contaminate many wells</td>
<td>Direct negative</td>
<td>In areas along coal transportation roads and near mine sites</td>
<td>Construction and operational phases</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>11. Mismatch in regard to local supply vs. mine demand and consumption patterns</td>
<td>The mine’s present local purchase policy is unclear but has raised local expectations to supply home-produced products</td>
<td>Direct negative</td>
<td>OT Project impact area</td>
<td>Construction and operational phase</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>12. Continued failure to become mine suppliers</td>
<td>The purchase of local products will promote competition between sellers with many being unable to meet requirements</td>
<td>Direct negative</td>
<td>OT Project impact area</td>
<td>Construction and operational phases</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
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</table>
### 9.5.9 Government services, safety/crime infiltration and resettlement

<table>
<thead>
<tr>
<th>POTENTIAL IMPACTS/ISSUES</th>
<th>CAUSES</th>
<th>NATURE</th>
<th>GEOGRAPHIC EXTENT</th>
<th>DURATION</th>
<th>MAGNITUDE</th>
<th>LIKELIHOOD</th>
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<tbody>
<tr>
<td><strong>Local government and governance</strong></td>
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</tr>
<tr>
<td>1. Increased activities by local NGOs and interest groups</td>
<td>Equitable access to and participation in assessing and monitoring socio-economic and environmental impacts</td>
<td>Cumulative positive</td>
<td>OT Project impact area</td>
<td>Throughout the life of mine</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>2. Improved local commitment to effective evaluation and monitoring of mine activities</td>
<td>Support of local authorities and stakeholders associated with OT Project</td>
<td>Direct positive</td>
<td>Soums in OT Project impact area</td>
<td>Throughout the life of mine</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>3. Burden to manage normal functions at soum public services</td>
<td>Increased out-migration of citizens and schoolchildren from some soums to those closer to the mine</td>
<td>Indirect negative</td>
<td>In the Manlai and Bayan-Ovoo soums</td>
<td>Limited to those soums</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>4. Increased crime and violations</td>
<td>In-migration associated with increased employment and attractive wages, both at mine and in improved local economy</td>
<td>Direct/ indirect and negative</td>
<td>OT Project impact area</td>
<td>Construction, operation and after closure</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>5. Increased social pathologies, i.e. drinking, gambling and prostitution</td>
<td>Increased in-migration, employment and disposable income</td>
<td>Cumulative and negative</td>
<td>OT Project impact area and elsewhere in association with other mine projects</td>
<td>Lifespan of the project</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>6. Breaking or ignoring local customs and traditions</td>
<td>Mix of different cultures and inappropriate actions by some individuals</td>
<td>Cumulative and negative</td>
<td>OT Project impact area and elsewhere in association with other mine projects</td>
<td>Lifespan of the project</td>
<td>Moderate</td>
<td>High</td>
</tr>
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</table>

**Resettlement and Associated Burdens**

| 1. Displacement of permanent herding infrastructure | Planned and unforeseen resettlement of families and their immobile properties | Direct/indirect negative | Areas where resettlement occurs  
- Undeterminable with potential cases along roads and railway | Lifespan of the project | High | High |
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<tbody>
<tr>
<td>2. Reduced human resources for herding</td>
<td>Increased employment for the locals</td>
<td>Indirect negative</td>
<td>OT Project impact area</td>
<td>Construction and operational phases</td>
<td>High</td>
</tr>
<tr>
<td>3. False claims for resettlement</td>
<td>Common and false belief that OT and other mine projects will accept any/all resettlement complaints and claims by herders</td>
<td>Indirect negative</td>
<td>OT Project impact area</td>
<td>Construction phase</td>
<td>Low</td>
</tr>
</tbody>
</table>
9.6 POTENTIAL IMPACT MITIGATION MEASURES

The SIA should not only present forecasts of potential impacts that any activities may cause - it should identify the means to manage and mitigate adverse impacts and enhance positive impacts.

As detailed in the preceding chapters, field surveys undertaken at soums in the OT Project impact area and community consultations with representatives from various community member groups, have helped to identify a range of impacts that differ in nature and have other peculiarities.

Ideally, mitigation measures should be built into the project planning process, but it is appropriate to identify mitigation measures even if they are not immediately adopted or if they would be the responsibility of other stakeholders. Regardless of who takes or would take responsibility and participate, the mines and their partners should make adequate efforts to avoid all adverse impacts and build upon positive effects of the Project.

The two steps of sequencing - avoiding and minimizing - can apply to the project itself or to the host community or the impacted area.

The first step in evaluating potential mitigation for each variable is to determine whether the proponent could modify the project or proposed policy to avoid the adverse effects. For example, re-routing a road that displaces families could be planned. If avoidance is not possible, then the next step is to identify ways to minimize adverse social impacts. For example, extend the construction period to minimize in-migration. Finally, if there are to be positive impacts, then it is important to try to utilize them as the basis for improving the standards of living of people impacted by the Project.

The impact assessment sections of this report discussed ways of managing the impacts identified in this study. The table below summarizes these suggestions for ease of reference.
### 9.6.1 Proposed impact management measures

#### 9.6.1.1 Local economy, local business development and infrastructure

<table>
<thead>
<tr>
<th>Elements</th>
<th>Activities and Task Descriptions</th>
<th>Responsibilities</th>
<th>Timing</th>
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</thead>
</table>
| 1. Increased pressure on existing infrastructures | ● Update OT Influx management plan with workforce localization arrangements  
● Improve involvement and role of soum government in population influx management  
● Amend energy, water and communication infrastructure development plan to extend access for potential users | ● OT management  
● HR  
● CRSD with involvement of aimag/soum government) | Construction phase and onwards |
| 2. Increased costs for infrastructure maintenance after mine closure. | ● Update mine closure plan to reflect new and re-planned development options  
● Integrate mine closure plan with long-term national and local development plans and program | ● OT management  
● CRSD  
● HR (with involvement of aimag/soum government and private service providers) | Construction phase and onwards, as well as closure. |
| 3. Increased business competition and local business sensitivity | ● Promote and support fair business competition  
● Early implementation of the local purchase policy and related measures as a response to local expectations  
● Take integrated measures to comply with both the soum and mine SME development policies and programs  
● Provide training to improve product/service presentation and handling | ● CRSD  
● SERD (Stakeholders engagement and regional development department)  
● Procurement (with involvement of aimag/soum government and local businesses) | Construction phase and onwards |
| 4. Destabilizing local businesses | ● Ensure equity within local purchase plan  
● Support business cooperation and specialization among local entrepreneurs  
● Some types, especially small shops and services may be destabilized, so need particular support | ● CRSD  
● Procurement  
● SERD with involvement of aimag/soum government and local businesses) and | Construction phase and onwards |
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</table>
| 5. Increased local budget revenues and needs to upgrade community trust toward contributions to local budgets | Diversify the forms of and arrangements for mine contributions to local budget revenues  
Work with soum government towards transparently managing the mine contributions  
Improve information disclosure and transparent information networking with all layers of local communities | CRSD (with involvement of soum government)  
Procurement with involvement of the central/aimag and soum government)  
Government relations  
Finance  
PIC | Construction phase and onwards |
| 6. Improved local cash retention and sustained cash flows | Increased employment for the locals  
Clarify the local recruitment plan - by years  
Provide training and refresher training for local workforce to be recruited | CRSD (with involvement of soum government and banks)  
Human Resources (HR)  
OT management | Construction phase and onwards |
| 7. Mismatch in regard to local supply vs. mine demand and consumption patterns. | Update the local purchase policy and strategy and develop an expectation management plan  
Joint assignments with soums in the OT Project impact area and beyond  
Training and demonstration for local producers | CRSD  
Procurement Department | Construction phase and onwards |
| 8. Continued failure to become mine suppliers | Update the local purchase policy and strategy and develop an expectation management plan  
Jointly with soums arrange measures to promote producers and service provides to become organized as suppliers groups  
Support and regulations by local governments | CRSD (with involvement of soum government and private entrepreneurs)  
Procurement department | Construction phase and onwards |
| 9. Improved segmentation and protection of local markets | Support local businesses to retain local markets  
Ensure equity of access to local markets through implementing transparent local purchase policy | CRSD  
Procurement department  
Finance | Construction phase and onwards |
### 9.6.1.2 Population

<table>
<thead>
<tr>
<th>Elements</th>
<th>Activities and Task Descriptions</th>
<th>Responsibilities</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Increased population growth</td>
<td>• Minimizing in-migration through OT’s Employment Action Plan</td>
<td>• CRSD</td>
<td>Construction phase and onwards</td>
</tr>
<tr>
<td></td>
<td>• Regulating in-migration as approved and implemented by the Umnugovi aimag Government</td>
<td>• Human Resources (HR)</td>
<td></td>
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<tr>
<td>2. Changed population gender composition</td>
<td>Encouraging female-workers through OT’s Employment Action Plan</td>
<td>• HR/training</td>
<td>Construction phase and onwards</td>
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<td></td>
<td></td>
<td>• OT management</td>
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<td></td>
<td></td>
<td>• CRSD</td>
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<tr>
<td>3. Changed family formation and wellbeing</td>
<td>Planning and implementing a „family-friendly” Employment Action Plan</td>
<td>• HR</td>
<td>Construction phase and onwards</td>
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<td></td>
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<td>• CRSD</td>
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</table>

### 9.6.1.3 Employment

<table>
<thead>
<tr>
<th>Elements</th>
<th>Activities and Task Descriptions</th>
<th>Responsibilities</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Increased employment for locals</td>
<td>IMMI plans to maximize Mongolian employment levels (achieve a 90% national workforce by the fifth year of operation)</td>
<td>• HR</td>
<td>Construction phase and onwards</td>
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<td></td>
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<td>• OT management</td>
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<tr>
<td>2. Improved income</td>
<td>• The OT Project generate more employment and induce economic activity that may lead to higher incomes for participating households</td>
<td>• OT management</td>
<td>Construction phase and onwards</td>
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<td></td>
<td></td>
<td>• HR</td>
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<td></td>
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<td>• CRSD</td>
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<tr>
<td>3. Skills development for locals</td>
<td>• A minimum 3-year timeframe is needed to plan for, train and prepare a workforce for the OT operations</td>
<td>• HR/training</td>
<td>Construction phase and onwards</td>
</tr>
<tr>
<td></td>
<td>• OT’s training strategy includes conducting a labour census on the population in the Umnugovi to understand the sources of skilled and unskilled labour</td>
<td>• OT management</td>
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<td></td>
<td>• In addition, OT”s training strategy includes conducting a training-needs analysis (TNA) that will allow IMMI to identify skills and gaps that may be addressed through extensive training programs</td>
<td>• CRSD</td>
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<tr>
<td>4. Raising job performance quality</td>
<td>Upgrade skills of Mongolian workforce and knowledge level by working with expatriates and receiving training</td>
<td>HR</td>
<td>Construction phase and onwards</td>
</tr>
</tbody>
</table>
| 5. Increased employment for expatriates | - Initial staffing at OT will include a combination of expatriates and Mongolians  
- Expatriate personnel, with specific technical expertise, will assist with training and implementing operational procedures in the operation’s early years | HR | Construction phase and onwards |
| 6. Indirect employment | Local communities are to be enabled to provide services and supplies to the mine camps and services for the increased population, as a way of generating indirect employment | CRSD | Construction phase and onwards |
| 7. Disaffection among locals due to outsiders taking jobs | - OT’s main goals in recruitment and training strategies are to ensure that preference is given to hiring from Umnugovi communities through a transparent and fair process  
- The importance of an active succession planning process to enable Mongolians to gradually fill senior positions is paramount | HR | Construction phase and onwards |
| 8. Conflicts between locals and outsiders | - The OT community-relations approach is to build enduring relationships with its neighbours, characterized by mutual respect, active partnerships, trust and long-term commitments  
- Good management of community relationships is necessary for OT’s business success  
- Good performance requires accepting responsibility for community relationships | CRSD | Construction phase and onwards |
| 9. Gender impact on workforce participation | Encouraging female-workers through OT’s Employment Action Plan | HR | Construction phase and onwards |
## 9.6.1.4 Health

<table>
<thead>
<tr>
<th>Elements</th>
<th>Activities and Task Descriptions</th>
<th>Responsibilities</th>
<th>Timing</th>
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</table>
| 1. Reduced access to and range of health care services | - In view of population increases the Government should adjust central budget distribution and make the health budget flexible  
- Investing by OT will be important in strengthening health organizations’ capacities; design and implement an Action Plan to improve access to and quality of health services  
Soum administration should support establishing private medical practices in the OT Project impact area | CRSD (with involvement of central/aimag/soum government)  
CRSD (with involvement of national/aimag/soum government and hospital)  
Procurement department | Construction phase and onwards |
| 2. RH access and FP services and their quality | - Soum administration and the OT Project may jointly provide technical and financial assistance to implement the national health program, in particular the Reproductive Health Program at Family Centers  
- Local community members should be mobilized to participate in training and promotional activities  
- The Government should establish mechanisms to conduct and monitor STDs/HIV/AIDS tests for Mongolian and foreign employees arriving on site | CRSD (with involvement of national/aimag/soum government)  
Procurement department | Construction phase and onwards |
| 3. Living environment changes cause health issues | The Government should design and implement an Action Plan to improve infrastructure, water supplies and environmental health. Government should ensure that mining companies operating in the OT Project impact area include actions to be taken where local community members face health issues consequent to their activities in their Environmental Rehabilitation Action Plans | CRSD (with involvement of national/aimag and soum government)  
OT Environmental Management and Monitoring Department (EMMD) | Construction phase and onwards |
4. Impacts on food safety and food supplies

- The Government should design and implement an Action Plan to create systems to ensure and monitor food safety
- In order to support community members in the Project’s directly, indirectly and cumulatively influenced areas, OT may take initiative to provide financial assistance to meet food demands and assist in building adequate food storage facilities
- A laboratory to test food quality in local areas is required to be established

<table>
<thead>
<tr>
<th>4. Impacts on food safety and food supplies</th>
<th><strong>The Government should design and implement an Action Plan to create systems to ensure and monitor food safety</strong></th>
<th><strong>CRSD</strong> (with involvement of national/aimag and soum government)</th>
<th>Construction phase and onwards</th>
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<tbody>
<tr>
<td></td>
<td><strong>In order to support community members in the Project’s directly, indirectly and cumulatively influenced areas, OT may take initiative to provide financial assistance to meet food demands and assist in building adequate food storage facilities</strong></td>
<td><strong>HSES</strong></td>
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<tr>
<td></td>
<td><strong>A laboratory to test food quality in local areas is required to be established</strong></td>
<td><strong>Procurement</strong></td>
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9.6.1.5: Education

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<th>Elements</th>
<th>Activities and Task Descriptions</th>
<th>Responsibilities</th>
<th>Timing</th>
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</thead>
<tbody>
<tr>
<td>1. Pressure on facilities, services and infrastructure at kindergartens and schools (and dormitories)</td>
<td>OT is requested to work with local government to financially support improving kindergartens and schools capacities and also to minimize influx through its Employment Action Plan</td>
<td>CRSD (with involvement of aimag/soum government)</td>
<td>Construction phase and onwards</td>
</tr>
<tr>
<td>2. Expanded skills base: Increased population with professional/higher education</td>
<td>Planning and implementing a Skills Development and Education Action Plan</td>
<td>CRSD (with involvement of soum government)</td>
<td>Construction phase and onwards</td>
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<tr>
<td>3. School drop-out impact</td>
<td>Minimizing negative impacts and maximizing positive impacts through planning and implementing a ‘Family-friendly’ Employment Action Plan. Parents should give more attention to their school-aged children</td>
<td><strong>CRSD</strong> (with involvement of soum government)</td>
<td>Construction phase and onwards</td>
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</table>
| 4. Shortage of professional degreed teachers | - It is recommended the OT Project may collaborate with aimag and soum administration to contribute financially to implement programs to solve social problems and housing conditions for teachers in local areas, as well as programs to support teachers  
- The Ministry of Education, Science and Culture should have a policy with measures to solve challenges faced by schools with lower enrolments | CRSD (with involvement of national/aimag and soum government) | Construction phase and onwards |
5. More opportunities to reach adequate levels of professional teachers at schools

Cooperation of OT project with aimag and soum administration and relevant services would be essential for professionals at local schools and kindergartens and contribute to their upgrading

| CRSD (with involvement of soum government) | Construction phase and onwards |

### 9.6.1.6 Cultural heritage

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<th>Elements</th>
<th>Activities and Task Descriptions</th>
<th>Responsibilities</th>
<th>TIMING</th>
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</thead>
</table>
| **1. Increased illegal excavation and disturbance of significant paleontological and archaeological objects and sites** | • Develop a general plan for OT Project impact area cultural heritage preservation towards integrated actions  
• Conduct survey on illegally excavated paleontological and archaeology sites during pre- and during project  
• Introduce regular cooperation with soum authorities on local cultural heritages  
• Support local handcrafting that can be competitive to replace original cultural heritage objects  
• Regular actions and training activities for mine workers and local stakeholders | • CRSD (with involvement of soum government)  
• Environmental department  
• OT management | Exploration, construction phases and onwards |
| **2. Changed local traditional customs and cultural identity** | • Conduct an expedition to collect sources and ethnographic descriptions of important rituals and customs  
• Organize community awareness promotion activities:  
  o local heritage festivals  
  o conferences and consultation workshops  
  o various contests and other public activities  
• Research living heritages as a documentary resource for local cultural heritages | • CRSD with local community participants and aimag and national museums  
• Environmental department | Exploration, construction phases and onwards |
| **3. Better conditions for preservation and protection of cultural heritages** | • Detail descriptions for objects officially registered as cultural heritages found in the OT Project impact area and develop an effective monitoring system  
• Provide honorarium for volunteer cultural heritage overseers/rangers | • CRSD  
• EMMD | Exploration, construction phases and onwards |
### 4. Changed local traditional customs and responses

- Conduct enhanced survey to document on-going and further changes in local traditions and responses
- Encourage interculture exchange of best morals and customs through improved community participation

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<th>Responsibilities</th>
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<tbody>
<tr>
<td>CRSD</td>
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<tr>
<td>HR</td>
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<td>OT management</td>
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**Timing:** Exploration, construction phases and onwards

### 9.6.1.7 Socio-economic aspects of the environmental impacts

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<th>Elements</th>
<th>Activities and Task Descriptions</th>
<th>Responsibilities</th>
<th>Timing</th>
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</table>
| 1. Environmental (air, soil, water, fauna, flora, etc.) pollution by dust and dust-borne contaminants | Recommendation to implement the following activities incorporated in the OT EIA:  
- Develop an air quality monitoring program  
- Management plan to reduce dust-borne pollution and air contamination  
- Early building of railway and hardtop truck roads | OT Management  
EMMD  
CRSD (with involvement aimag/soum government and aimag Professional Inspection Agency) | Exploration, construction phases and onwards |
| 2. Soil degradation and vegetation cleaning | Damage to fragile Gobi soils and destroy vegetation cover making impossible to be restored | CRSD  
EMMD (with soum government and local stakeholders) | Exploration, construction phases and onwards |
| 3. Depleted underground water table | Recommendation to implement the following activities incorporated in the OT EIA:  
- Establish a joint water monitoring team including local representatives – herders and soum officials  
- Amend OT Resettlement Policy with possible relocation of herder households in Gunii Khooloi and other OT water supply areas, where well water tables are depleted to unmanageable levels | CRSD  
EMMD (with soum government and local stakeholders) | Exploration, construction phases and onwards |
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<th>Elements</th>
<th>Activities and Task Descriptions</th>
<th>Responsibilities</th>
<th>Timing</th>
</tr>
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</table>
| 4. Wildlife migration          | ● Recommendation to implement the following activities incorporated in the OT EIA:  
                                  ● Develop and implement a wildlife management and monitoring plan                                                                                                          | ● EMMD                                                                          | Exploration, construction phases and after closure               |
| 5. Impacts on strictly protected areas | Recommendation to implement the following activities incorporated in the OT EIA:  
                                  ● Develop and implement a Small Gobi Strictly Protected Area wildlife management and monitoring plan  
                                  ● Keep the mine closure plan updated and amended                                                                                                                       | ● EMMD (with Small Gobi Strictly Protected Area administration)  
                                  ● CRSD                                                                          | Exploration, construction phases and onwards                                   |
| 6. Solid waste management      | ● Develop and implement a solid waste management plan in cooperation with local administration and stakeholders                                                                                                                  | ● EMMD                                                                          | Exploration, construction phases and onwards                     |
| 7. Visual impacts              | ● Establish a consultative group on visual environment restoration including local stakeholders  
                                  ● Survey local attitudes and reactions to environmental rehabilitation                                                                                                          | ● OT Management  
                                  ● EMMD                                                                          | Exploration, construction phases and onwards                           |
                                  ● CRSD (with local government)                                                                                                                                                    |                                                                                  |
### 9.6.1.8 Land, pasture and water supply

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<tr>
<th>Elements</th>
<th>Activities and Task Descriptions</th>
<th>Responsibilities</th>
<th>Timing</th>
</tr>
</thead>
</table>
| 1. Loss of land | - Timely revisions of and amendments to the OT IDP and other plans\(^{35}\)  
- Implement mitigation measures in the framework of OT IDP in association with aimag and soum land management and local development plans. | OT management  
CRSD  
EMMD | Construction phase and onwards (better to be considered and planned before resettlement and displacement plans approved) |
| 2. Rights for land-based local businesses and other activities | - Work together with soums in the framework of the long-term land management policy and local development action plan | Government Relations department  
CRSD  
EMMD | Construction phase and onwards |
| 3. Pastureland degradation and desertification | - Participatory updates of Environmental management and Monitoring program including land and other ecosystem components of the OT Project impact area  
- Integrated mitigation activities in the framework of the OT IDP integrated with Aimag and soum land management plan and long-term development plan for affected soums  
- Early completion of projects to build railway and hardtop roads as a part of OT and other mine project infrastructure development program  
- Develop and implement an environmental program involving other mines  
- Training and demonstration of pasture restoration techniques and assisting local initiatives | EMMD  
CRSD  
OT management (with local government and user groups) | Construction phase and onwards |

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\(^{35}\) *Oyu Tolgoi Project Environmental Impact Assessment, Volume II: Report of the ground water use within Galbyn Gobi and Gunii Khooloi underground water resource areas, Environmental protection and Environmental monitoring plan, 2004*
<table>
<thead>
<tr>
<th>Elements</th>
<th>Activities and Task Descriptions</th>
<th>Responsibilities</th>
<th>Timing</th>
</tr>
</thead>
</table>
| 4. Dust-polluted pasture vegetation | ● Early completion of projects to build railway and hardtop roads as a part of OT and other mine project infrastructure development program  
   ● Regular dust-suppression measures (wetting, halting road diverting, restoring truck-damaged land, etc.)  
   ● Implement measures in the framework of the Socio-economic and Environmental Management Plan | ● OT management  
   ● EMMD  
   ● CRSD  
   ● Government Relations department | Construction phase and onwards |
| 5. Domestic and wild animal health | ● Implement OT IDP and Socio-economic and Environmental Management Plan  
   ● Conduct survey on diagnosis, therapeutic and preventive measures for diseases and disorders among domestic/wild animals that might be caused by dust and other contamination in cooperation with aimag and soum health and veterinary organizations  
   ● Accelerate implementation of a national „Livestock Health” program, etc | ● OT management  
   ● EMMD  
   ● CRSD | Construction phase and onwards, as well as closure. |
| 6. Pasture division and users separated from water sources | ● Undertake SIA on railway, hardtop roads and water pipelines  
   ● Timely revisions of and amendments to OT IDP and other related plans/program  
   ● Jointly with soums, develop and implement plan for relocation of affected households/properties and utilization of natural resources in the area affected | ● OT management  
   ● EMMD  
   ● CRSD | Construction phase and onwards |
| 7. Changed pastoral herding migration and reduced mobility | ● Undertake SIA on railway, hardtop roads and water pipelines  
   ● Jointly with other mines and OT Project impact area soums, develop and implement plan for relocation of affected households/properties and utilization of natural resources in the area affected  
   ● Training and demonstration on effective pasture management for both local authorities and herding communities | ● CRSD  
   ● EMMD (with aimag/soum government) | Construction phase and onwards |
### 9.6.1.9: Government service, safety/crime induction and resettlement

<table>
<thead>
<tr>
<th>Elements</th>
<th>Activities and Task Descriptions</th>
<th>Responsibilities</th>
<th>Timing</th>
</tr>
</thead>
</table>
| 1. Poor promotion and involvement for local stakeholders                | • Promotion of local stakeholders through extended public and community consultation and information networking  
   • Extended public-private partnership and NGO participation in governance and public decision making  
   • Develop a comprehensive communication program | • CRSD  
   • SERD  
   • Government Relations department (with *soum* government and local stakeholders) | Construction phase and onwards                                                          |
| 2. Burden to manage normal functions at *soum* public services           | • Capacity building for officials and upgrading facilities required                              | • CRSD  
   • Government relations (with *soum* government)                                      | Construction phase and onwards                                                          |
| 3. Increased crime and violations                                        | • Development and implementation of a Crime Management program as a part of influx management is required  
   • Support to *soum* police unit and its servants  
   • Plan and implement sound community safety measures in cooperation with local authorities  
   • Implement more stringent recruitment policy and procedures  
   • Regular and fruitful information exchanges and feedback networking                 | • CRSD  
   • OT management  
   • HR  
   • Government relation department (with *soum* government and *soum* police)         | Construction phase and onwards                                                          |
| 4. Increased social pathologies, such as, alcoholism, gambling and prostitution | • Implement more stringent recruitment policy and procedures to prevent legally-convicted and ill-behaving individuals being recruited  
   • Improve awareness promotion activities for healthy lifestyles  
   • Establish formal grievance systems                                                 | • CRSD  
   • HR  
   • OT management (with *soum* government *soum* police)                              | Construction phase and onwards                                                          |
<table>
<thead>
<tr>
<th>Elements</th>
<th>Activities and Task Descriptions</th>
<th>Responsibilities</th>
<th>Timing</th>
</tr>
</thead>
</table>
| 5. Displacement of immovable herding infrastructure | • Review and redesign aggregated criteria to set exclusion zones and areas where new infrastructure is to be built  
• Draw up common resettlement and relocation procedures in cooperation with other mines to ensure that affected people are treated equally  
• Establish formal grievance systems                                                                                                                                    | • CRSD  
• OT management  
• EMMD (with soum government)                                                                                                                                             | Construction phase and onwards                |
| 6. False resettlement claims                  | Avoid unnecessary resettlement by enforcing clear resettlement criteria                                                                                                                                                          | CRSD                                                                                         | Construction phase and onwards                |
| 7. Phenomenon „rural to soum centre migration“ among herding communities | • Clarify mine workers’ localization plan  
• Implement localized recruitment policy in cooperation with other mines  
• Re-design land management plan for soums in compliance with influx policy                                                                                             | • HR  
• OT management  
• CRSD                                                                                                                                           | Construction phase and onwards                |
### 9.7. OVERALL SUMMARY OF IMPACTS AND MEASURES

#### 9.7.1 Direct impacts

<table>
<thead>
<tr>
<th>Impact Areas</th>
<th>Description of Impacts</th>
<th>Current status</th>
<th>Nature</th>
<th>Significance</th>
<th>Proposed mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Local economy, local business development and infrastructure</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
| 1. Improved sensitivity, flexibility and responsiveness by local businesses to market affairs | ● Consumer-specific (OT Project) demands will challenge businesses to compete for its markets  
● Increased local commitment to and expectation of becoming suppliers will promote better marketing  
● Realistic OT Project policy to promote fair business competition and equity will keep local businesses competitive | Opportunities for local businesses and services in mine-provided markets are not extended/sustained and OT policy, strategy and requirements are not completely understood | Positive | High | ● Update the local purchase policy and strategy and develop an expectation management plan  
● Joint assignments with soums in the OT Project impact area and beyond Training and demonstration for local producers |
| 2. Improved segmentation and protection of local markets | Local businesses and service providers are and will be challenged to protect their markets from competition and penetration threats by outsider businesses | At present no visible action has been taken for market protection, but OT’s clear commitment to not only support local businesses, but also local markets will provide conditions for the OT Project impact area businesses to be successful and viable | Positive | Moderate | ● Support local businesses to retain local markets  
Ensure equity of access to local markets through implementing transparent local purchase policy |
<p>| 3. Poor community trust towards mine contributions to | ● Less transparency and poor availability of information on mine contributions to soum budgets and lack of accountability at local | ● No decisive action and measures have been taken to strictly administer revenue transfer by the | Negative | Moderate | ● Update the local purchase policy and strategy and develop an expectation management plan |</p>
<table>
<thead>
<tr>
<th>Impact Areas</th>
<th>Description of Impacts</th>
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<th>Nature</th>
<th>Significance</th>
<th>Proposed mitigation measures</th>
</tr>
</thead>
</table>
| local budgets | government may affect community trust  
  ● Poor reputation risk for the OT Project | mines and local government transparency  
  ● Local government and authorities are less supportive of the accountability policy | | |  
  ● Jointly with soums arrange measures to promote producers and service providers to become organized as suppliers groups through streamlining a part of the mine contributions  
  ● Support and regulations by local governments |

**Population**

1. Increased population growth  
   In-migration has appeared and will continue adding more to the growth of local population  
   Little done to appropriately manage population influx  
   Positive/ Negative  
   High  
   • Minimizing in-migration through OT”s Employment Action Plan  
   • Regulating in-migration as approved and implemented by the Umnugovi aimag Government

2. Changed population gender composition  
   Changes in the gender ratio will be viewed as a result of gender-preference employment  
   No clear strategy to keep right balance has been worked out  
   Negative  
   Moderate  
   Encouraging female-workers through OT”s Employment Action Plan

3. Changed family formation and well-being  
   In addition to existing families, marriages and in-migration of families will change patterns of family formation and well-being  
   OT”s strategy to manage family patterns is required to be worked out  
   Negative  
   Moderate  
   Planning and implementing a „family-friendly” Employment Action Plan

**Employment**

1. Increased  
   OT policy to recruit the locals  
   The time for the OT  
   Positive  
   High  
   IMMI plans to maximize
<table>
<thead>
<tr>
<th>Impact Areas</th>
<th>Description of Impacts</th>
<th>Current status</th>
<th>Nature</th>
<th>Significance</th>
<th>Proposed mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>employment for locals</td>
<td>favours the employment rate among Mongolians to increase</td>
<td>strategy to be implemented in its full scale has not arrived</td>
<td></td>
<td></td>
<td>Mongolian employment levels (achieve a 90% national workforce by the fifth year of operation)</td>
</tr>
</tbody>
</table>
| 2. Improved income                 | ● OT Project would allow more individuals and families to engage in direct and indirect employment  
● As a result expectations are high that OT would create opportunities for both individuals and families to earn income | Low employment and low-paid temporary jobs have not been enough to bring income level up      | Positive | High         | The OT Project generate more employment and induce economic activity that may lead to higher incomes for participating households |
| 3. Skills development for locals   | Due to the low skills, locals fail to be directly recruited. Therefore, it needs to train them to meet the requirements for mine employment | No extended training and skill upgrading has been commenced because of a delay in operational phase | Positive | Moderate      | ● A minimum 3-year timeframe is needed to plan for, train and prepare a workforce for the OT operations  
● OT”s training strategy includes conducting a labour census on the population in the Umnugovi to understand the sources of skilled and unskilled labour  
● In addition, OT”s training strategy includes conducting a training-needs analysis (TNA) that will allow IMMI to identify skills and gaps that may be addressed |
<table>
<thead>
<tr>
<th>Impact Areas</th>
<th>Description of Impacts</th>
<th>Current status</th>
<th>Nature</th>
<th>Significance</th>
<th>Proposed mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Raising job performance quality</td>
<td>Improved professional skills and job performance would enable locals to compete for jobs at OT and engage in well-paid permanent jobs</td>
<td>No evident measures have been taken to upgrade local skills and experiences in conformity with the OT local employment policy</td>
<td>Negative</td>
<td>Moderate</td>
<td>Upgrade skills of Mongolian workforce and knowledge level by working with expatriates and receiving training</td>
</tr>
<tr>
<td><strong>Health</strong></td>
<td></td>
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</tr>
</tbody>
</table>
| 1. Reduced access to and range of health care services | Because of high expectations to be employed by the mines, influx appears to be increasing and local hospitals seem to take increased load | No projections and estimates are available to predict pressure expected and neither local government nor the mines have entered into looking at this issue | Negative | High         | • In view of population increases the Government should adjust central budget distribution and make the health budget flexible  
• The OT Project may think of investing in strengthening health organizations’ capacities; design and implement an Action Plan to improve access to and quality of health services  
• *Soum* administration should support establishing private medical practices in the OT Project impact area |
<p>| 2. Impacts on food safety and | Arrival of people with different consumption habits and tastes will | Special surveys and assessments are required | Negative | Moderate     | • The Government should design and implement an                                           |</p>
<table>
<thead>
<tr>
<th>Impact Areas</th>
<th>Description of Impacts</th>
<th>Current status</th>
<th>Nature</th>
<th>Significance</th>
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</tr>
</thead>
</table>
| food supplies        | jeopardize the safety of food because volume and variety demanded will outstrip the capacity to regulate standards. | to be undertaken to understand current food safety and supply system to generate basic data for further actions |        |              | Action Plan to create systems to ensure and monitor food safety  
|                      |                                                                                        |                                                                                |        |              |   • In order to support community members in the Project’s directly, indirectly and cumulatively influenced areas, OT may assist with financial support to meet food demands and build adequate food storage facilities  
<p>|                      |                                                                                        |                                                                                |        |              |   • Government should build a laboratory to test food quality in local areas                   |
| Education            |                                                                                        |                                                                                |        |              |                                                                                  |
| 1. Pressure on facilities, services and infrastructure at kindergartens and schools (and dormitories) | It is expected that number of children of pre-school and school age will increase resulting from population growth and education service will experience more pressure | A projection is needed to predict the scale of pressure on educational infrastructures in each soum and to work out strategy that advises localization of mineworkers in terms of soum capacity to accommodate additional pressure | Negative | Moderate   | OT is requested to work with local government to financially support improving kindergartens and schools capacities and to minimize influx through its Employment Action Plan |
| 2. Shortage of professional | The already sufficient number of teachers expresses interest to apply | This issue has not been developed crucially. As a | Negative | High        | • The OT Project should collaborate with aimag                                               |</p>
<table>
<thead>
<tr>
<th>Impact Areas</th>
<th>Description of Impacts</th>
<th>Current status</th>
<th>Nature</th>
<th>Significance</th>
<th>Proposed mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>degreeed teachers</td>
<td>for jobs at the mines for high payment. Due to this, the soum schools may experience loss of qualified teachers</td>
<td>part of the Teacher Support programme, OT may think of ways to retain teachers at their job position.</td>
<td></td>
<td></td>
<td>and soum administration to contribute financially to implement programs to solve social problems and housing conditions for teachers to work in local areas, as well as programs to support teachers</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>• The Ministry of Education, Science and Culture should have a policy with measures to solve challenges faced by schools with lower enrolments</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• OT Project action plans include provisions to enhance locally available skills through systematic approach to keep competition for limited jobs low</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Planning and implementing a Skills Development and Education Action Plan</td>
</tr>
<tr>
<td>3. Expanded skills base:</td>
<td>Various actions by the locals and the mines to upgrade local skills and professional background will substantially improve local skills base</td>
<td>OT Project action plans include provisions to enhance locally available skills through systematic approach to keep competition for limited jobs low</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>increased population with</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Positive Moderate</td>
</tr>
<tr>
<td>professional and high education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Planning and implementing a Skills Development and Education Action Plan</td>
</tr>
<tr>
<td><strong>Cultural Heritage</strong></td>
<td></td>
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</tr>
</tbody>
</table>
| 1. Better conditions for         | It seems likely that objects of cultural and historic significance will be under constant threat unless effective and long-term planned activities are initiated by both the local people and the mines | • There is a lack of proper guarding to protect immovable objects  
• Facilities at local museums and other places remain unsatisfactory, outdated and dilapidated |         |              | Positive High  
• Detailed descriptions for objects officially registered as cultural heritages found in the OT Project impact area and develop an effective monitoring system |
<table>
<thead>
<tr>
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<th>Nature</th>
<th>Significance</th>
<th>Proposed mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment and Natural Resources</td>
<td></td>
<td>No proper and regular actions are taken for participatory preservation and restoration</td>
<td></td>
<td></td>
<td>• Provide honorarium for volunteer cultural heritage overseers/rangers</td>
</tr>
<tr>
<td>1. Pastureland availability and land use rights</td>
<td>Reduced size and forage resource of natural pasture due to pastureland taking and pollution/damage by dust and truck roads</td>
<td>Although there is sign to emerge problems associated with the availability and user rights of pasture, no evident measures are taken</td>
<td>Negative</td>
<td>High</td>
<td>• Work together with soums in the framework of the long-term land management policy and local development action plan</td>
</tr>
</tbody>
</table>
| 2. Pasture division and users separated from water sources                    | Building railway and hardtop highways will affect definite areas and herder households by separating their traditional grazing areas and water source on the alternative side of the infrastructures | No EIA and SIA has been enhancive to identify potential impacts                                                                                                                                                                         | Negative | High          | • Undertake SIA on railway, hardtop roads and water pipelines  
• Timely revisions of and amendments to OT IDP and other related plans/program  
Jointly with soums, develop and implement plan for relocation of affected households/properties and utilization of natural resources in the area affected |
<p>| Socio-economic aspects of environmental impacts                               |                                                                                         |                                                                                                                                                                                                                                         |        |              | • Establish a consultative group on visual environment restoration                                                                                                                                         |
| 1. Visual impacts                                                            | Reduced local well-being due to significant changes to the environment and ecosystem where | Traffic, site explorations, damage to soil/vegetation and disappearance of                                                                                                                                                                   | Negative | Moderate     |                                                                                                                                                                                                             |</p>
<table>
<thead>
<tr>
<th>Impact Areas</th>
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<th>Significance</th>
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</tr>
</thead>
<tbody>
<tr>
<td>the locals live</td>
<td>wildlife</td>
<td></td>
<td></td>
<td></td>
<td>including local stakeholders</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>● Survey local attitudes and reactions to environmental rehabilitation</td>
</tr>
<tr>
<td><strong>Government services, safety/crime infiltration and resettlement</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Increased crime, violations and social pathologies</td>
<td>● The mines, the OT Project impact area in particular, will generate employment for workers that will include some ill-behaved and antisocial individuals</td>
<td></td>
<td></td>
<td>Negative</td>
<td>● Development and implementation of a Crime Management program as a part of influx management is required</td>
</tr>
<tr>
<td></td>
<td>● Recruitment is not properly overseen by both the mines and <em>soum</em></td>
<td></td>
<td></td>
<td>High</td>
<td>● Support to <em>soum</em> police unit and its servants</td>
</tr>
<tr>
<td></td>
<td>● Local police and stakeholders have less power to manage crime and violations</td>
<td></td>
<td></td>
<td></td>
<td>● Plan and implement sound community safety measures in cooperation with local authorities</td>
</tr>
<tr>
<td></td>
<td>● The mines lack a crime management plan</td>
<td></td>
<td></td>
<td></td>
<td>● Implement more stringent recruitment policy and procedures</td>
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<td></td>
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<td>● Regular and fruitful information exchanges and feedback networking</td>
</tr>
</tbody>
</table>
### 9.7.2 Indirect impacts

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<thead>
<tr>
<th>Impact Areas</th>
<th>Nature of Impacts</th>
<th>Current status</th>
<th>Nature</th>
<th>Significance</th>
<th>Proposed mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local economy, local business development and infrastructure</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1. Destabilized local businesses</td>
<td>• Fierce competition may severely impact small businesses&lt;br&gt;• Poor management of business competition may encourage presence of larger competitors</td>
<td>• Local small businesses are poorly diverse and less cooperative. They lack operational support&lt;br&gt;• Few of the mono-modal and vulnerable local businesses are unlikely to survive severe competition</td>
<td>Negative</td>
<td>Moderate</td>
<td>• Ensure equity within local purchase plan&lt;br&gt;• Support business cooperation and specialization among local entrepreneurs&lt;br&gt;Some types, especially small shops and services may be destabilized, so need particular support</td>
</tr>
<tr>
<td>2. Poor involvement by local stakeholders in governance affairs related to the mines.</td>
<td>• By not being transparent and accountable, local government may badly ignore local stakeholders&lt;br&gt;• Poor education of the locals in mining matters may prevent wider stakeholder participation</td>
<td>• Little is done to promote local stakeholders in day-to-day management of mine operations, either directly or through soum administration&lt;br&gt;• No participatory approach in place to handle this impact</td>
<td>Negative</td>
<td>Moderate</td>
<td>• Promotion of local stakeholders through extended public and community consultation and information networking&lt;br&gt;• Extended public-private partnership and NGO participation in governance and public decision making&lt;br&gt;• Develop a comprehensive communication program</td>
</tr>
<tr>
<td>3. Mismatching local supply capacity and demands the</td>
<td>Should the local expectations to supply mines and local come true will depend on local capacity and potentials</td>
<td>OT local purchase policy and strategy and regulations are not</td>
<td>Negative</td>
<td>Moderate</td>
<td>• Increase local income earning through sustainable local purchase policy</td>
</tr>
<tr>
<td>Impact Areas</td>
<td>Nature of Impacts</td>
<td>Current status</td>
<td>Nature</td>
<td>Significance</td>
<td>Proposed mitigation measures</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>---------------------------------------------</td>
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<td>-------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>consumption patterns of mines</td>
<td>completely worked out</td>
<td></td>
<td></td>
<td></td>
<td>• Introduce and implement strategy to purchase products and services locally based on annual planning</td>
</tr>
<tr>
<td>4. Failure to become mine suppliers</td>
<td>Increased competition to supply mines along with failure to ensure equity for each producers may result in poor expectation fulfillment</td>
<td>Expectations of the locals have not been fulfilled</td>
<td>Negative</td>
<td>Moderate</td>
<td>• Keep local purchase policy and strategy updated and develop and implement expectation management plan • Implement a joint measures for OT area and other mines • Organize training, demonstration for local producers</td>
</tr>
</tbody>
</table>

**Employment**

<p>| 1. Increased employment for expatriates          | The longer time required for training and preparing of Mongolian workers, and poor job discipline of them may require to keep more expatriates | The share of foreign employees remains high because the rate of Mongolian workers is low | Positive | Low         | • Initial staffing at OT will include a combination of expatriates and Mongolians • Expatriate personnel, with specific technical expertise, will assist with training and implementing operational procedures in the operation’s early years |
| 2. Indirect employment                            | Although the availability of additional employment of local people has been limited, it helps | Due to postponed launch of OT construction and operation, limited indirect | Positive | Low         | • Additional employment of local people • Local communities are |</p>
<table>
<thead>
<tr>
<th>Impact Areas</th>
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<th>Current status</th>
<th>Nature</th>
<th>Significance</th>
<th>Proposed mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>many residents to get job as alternative income source through being employed indirectly</td>
<td>employment is available</td>
<td>to be enabled to provide services and supplies to the mine camps and services for the increased population, as a way of generating indirect employment</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 3. Gender impact on workforce participation | Predominant male recruitment makes the jobs for the females less available leading to a gender impact | No clear strategy to allow females to be employed has been announced | Negative | Low | • Encouraging female-workers through OT’s Employment Action Plan  
• Pay more attention to provide jobs to family members of OT employees |
| Health | Mismatch between the increased recruitment of young people and managing of reproductive health issues | Little has been done to understand this issue | Negative | Moderate | • Soum administration and the OT Project jointly provides technical and financial assistance to implement the national health program, in particular the Reproductive Health Program at Family Centers  
• Local community members should be mobilized to participate in training and promotional activities  
• Establish mechanisms |
<table>
<thead>
<tr>
<th>Impact Areas</th>
<th>Nature of Impacts</th>
<th>Current status</th>
<th>Nature</th>
<th>Significance</th>
<th>Proposed mitigation measures</th>
</tr>
</thead>
</table>
| 2. Changes to living environment cause health issues | Incidences of diseases and illnesses suspected to be caused by dust and other factors are reported to be on rise | No measures for diagnosis and therapy of such illnesses are developed to develop efficient preventive actions | Negative | High         | • Design and implement an Action Plan to improve infrastructure, water supplies and environmental health  
  • Ensure that mining companies operating in the OT Project impact area include actions to be taken where local community members face health issues consequent to their activities in their Environmental Rehabilitation Action Plans |

**Education**

| 1. School drop-out impact | The overall performance of schoolchildren may weaken which may then lead to voluntary drop-out  
Children of those households whose working age members are hired by the mines may leave schooling | It is not known how big would be this impact, and the local concerns seem to be reasonable to be taken into account | Negative | Moderate     | • Minimizing negative impacts and maximizing positive impacts through planning and implementing a “Family-friendly” Employment Action Plan. Parents should give more |
<table>
<thead>
<tr>
<th>Impact Areas</th>
<th>Nature of Impacts</th>
<th>Current Status</th>
<th>Nature</th>
<th>Significance</th>
<th>Proposed mitigation measures</th>
</tr>
</thead>
</table>
| Cultural Heritage | Local traditions, customs and responses may undergo changes due to penetration by different cultures and the increased number of people that lack better knowledge of these | No measures have been planned to handle any major changes to local traditions, customs and responses | Medium | Moderate | • Conduct enhanced survey to document ongoing and further changes in local traditions and responses  
• Encourage interculture exchange of best morals and customs through improved community participation |
| Government services, safety/crime infiltration and resettlement | Increased population growth accompanied with various administrative and social affairs  
Pressure on local government to handle population, human resource | No measures are taken by both central and local government in response to increased population influx and movement  
No capacity building and enhancing working skills of local staff | Moderate | Moderate | • Capacity building for officials and upgrading facilities required  
• Integrated population and human resource management |
| 1. Burden to manage normal functions at soum public services | The field survey revealed that some herder households intended to lodge unjustifiable resettlement and relocation claims  
Some herder households appear unhappy to be relocated from their home areas | The policy and tactics to avoid unnecessary resettlements remains unclear  
The existing grievance management system needs further improvement | Negative | Moderate | Avoid unnecessary resettlement by enforcing clear resettlement criteria |
<p>| 2. False claims for resettlements (unnecessary resettlements), difficulties and unwillingness for involuntary resettlement | | | | | |</p>
<table>
<thead>
<tr>
<th>Impact Areas</th>
<th>Nature of Impacts</th>
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<th>Proposed mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Resettlement or dislocation may overburden people being resettled</td>
<td>As Mongolians say, „Once a rock is dislodged it wanders for a whole three years before getting to where it will stay”, thus, although resettlement can be a good thing, more burdens and worries may be experienced before getting settled</td>
<td>People, herders in particular, are concerned, about how reimbursement of costs and compensation for burdens after being relocated will be handled. It appears that resettlement procedures are to be revised to cover any additional costs and burdens</td>
<td>Negative</td>
<td>Moderate</td>
<td>Review and redesign aggregated criteria to set exclusion zones and areas where new infrastructure is to be built. Draw up common resettlement and relocation procedures in cooperation with other mines to ensure that affected people are treated equally. Establish formal grievance systems.</td>
</tr>
<tr>
<td>4. Phenomenon „rural to soum centre migration” among herding communities</td>
<td>• Continued land takes from pasture for infrastructures • Division of traditional grazing areas by railway and truck road/s • Setting exclusion zone and areas is apparently sometimes not well-planned</td>
<td>• No numbers and locations for herder households considering resettlement and their properties have been identified • Matters relating to building infrastructure have not finally been decided and made clear to those who may be affected</td>
<td>Negative</td>
<td>High</td>
<td>Implement more stringent recruitment policy and procedures to prevent legally-convicted and ill-behaving individuals being recruited. Clarify mine workers” localization plan. Implement localized recruitment policy in cooperation with other mines. Re-design land management plan for soums in compliance with...</td>
</tr>
<tr>
<td>Impact Areas</td>
<td>Nature of Impacts</td>
<td>Current status</td>
<td>Nature</td>
<td>Significance</td>
<td>Proposed mitigation measures</td>
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<tr>
<td><em>Local economy, local business development and infrastructure</em></td>
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</tr>
<tr>
<td>1. Increased pressure on existing infrastructure</td>
<td>Increased population influx resulting in increased consumption and needs to access infrastructures and establish new capacities by both mines and the locals.</td>
<td>● Upgrading for existing infrastructures appears to lag behind the demand for extended access&lt;br&gt;● Population growth supported by growth of local population and influx</td>
<td>Negative</td>
<td>High</td>
<td>● Update OT Influx management plan with workforce localization arrangements&lt;br&gt;● Improve involvement and role of <em>soum</em> government in population influx management&lt;br&gt;Amend energy, water and communication infrastructure development plan to extend access for potential users</td>
</tr>
<tr>
<td>2. Increased local budget revenues</td>
<td>● Direct contributions by mines to local budgets are rising&lt;br&gt;● Various donations and grant supports will ease and &quot;save&quot; some expenditure from local budgets</td>
<td>● The mines, including OT, have not reached their operational phase&lt;br&gt;● The phenomenon of &quot;big, small, and uncommitted budget demand&quot; is still in place</td>
<td>Positive</td>
<td>High</td>
<td>● Diversify the forms of and arrangements for mine contributions to local budget revenues&lt;br&gt;● Work with <em>soum</em> government towards transparently managing</td>
</tr>
<tr>
<td>Impact Areas</td>
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</table>
| 3. Increased costs for infrastructure maintenance after mine closure | ● The costs and expenditure required to maintain infrastructures built by the high-capacity mines will be considerable and may hardly affordable for the soums and users  
● Contributions to local budgets may reduce following pull-out by mines no longer operating | No national and/or local policy and program is in place for post-project maintenance to infrastructure in the OT and other mining areas | Negative | High         | ● Update mine closure plan to reflect new and re-planned development options  
● Integrate mine closure plan with long-term national and local development plans and program |
| 4. Improved local cash retention and sustained cash flows | ● Effects of increased employment and well-paid jobs  
● Better availability of basic and specific local banking services | The employment rate for Mongolian workers remains low although it is expected to be 90 percent in the fifth year after launching | Positive | High         | ● Increased employment for the locals  
● Clarify the local recruitment plan - by years  
● Provide training and refresher training for local workforce to be recruited |
| 5. Increased business competition                 | ● Increased business competition for highly concentrated markets with specific demands and consumption patterns | Regardless high expectations and mentally-led commitments among the locals, no competition has been emerged which | Positive | High         | ● Promote and support fair business competition  
● Early implementation of the local purchase policy and related |
### Impact Areas

<table>
<thead>
<tr>
<th>Impact Areas</th>
<th>Nature of Impacts</th>
<th>Current status</th>
<th>Nature</th>
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<th>Proposed mitigation measures</th>
</tr>
</thead>
</table>
| 8. Environmental pollution by dust and dust-borne contaminants | Dust generated and spread over large environmentally fragile areas causing pollution | No significant and community-acceptable measures have been taken to reduce dust generation and its environmental impacts | Negative | High         | Recommendation to implement the following activities incorporated in the OT EIA:  
  - Develop an air quality monitoring program  
  - Management plan to reduce dust-borne pollution and air contamination  
  - Early building of railway and hardtop truck roads |
| 9. Noise emissions                                | Reduced local well-being and health caused by overloaded and unloaded trucks driving on badly maintained roads | Mines do little to suppress high resonance noise generated by heavy trucks | Negative | High         |  
  - Develop and incorporate noise emission management and monitoring measures in OT EIA |
| 10. Solid                                        | Increased population growth and壄 | The current solid waste | Negative | Moderate     | Develop and                                                                                     |

**Socio-economic aspects of environmental impacts**

8. Environmental pollution by dust and dust-borne contaminants

- Dust generated and spread over large environmentally fragile areas causing pollution
- No significant and community-acceptable measures have been taken to reduce dust generation and its environmental impacts
- Negative
- High

Recommendation to implement the following activities incorporated in the OT EIA:
- Develop an air quality monitoring program
- Management plan to reduce dust-borne pollution and air contamination
- Early building of railway and hardtop truck roads

9. Noise emissions

- Reduced local well-being and health caused by overloaded and unloaded trucks driving on badly maintained roads
- Mines do little to suppress high resonance noise generated by heavy trucks
- Negative
- High

- Develop and incorporate noise emission management and monitoring measures in OT EIA

10. Solid

- Increased population growth and
- The current solid waste
- Negative
- Moderate
<table>
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<tr>
<th>Impact Areas</th>
<th>Nature of Impacts</th>
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<th>Significance</th>
<th>Proposed mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>waste management</td>
<td>establishment of large infrastructures Concentration of people and economic enterprises in settlements</td>
<td>handling has not been up to required level  ● No responses to the increased waste generation are taken</td>
<td></td>
<td></td>
<td>implement solid waste management in settlements and sites  ● Support local entrepreneurs to process waste through integrated management</td>
</tr>
<tr>
<td>11. Impacts on strictly protected areas</td>
<td>Trucks and rail infrastructure associated with noise emission and environmental degradation severely affect the biological integrity and diversity in the protected area</td>
<td>No integrated and long-term actions have been in place</td>
<td>Negative</td>
<td>High</td>
<td>Recommendation to implement the following activities incorporated in the OT EIA:  ● Develop and implement a Small Gobi Strictly Protected Area wildlife management and monitoring plan  ● Keep the mine closure plan updated and amended</td>
</tr>
<tr>
<td>12. Wildlife migration</td>
<td>No wild life found in their habitat areas</td>
<td>Too much noise and busy trucks driving over badly broken and narrow or subsidiary roads making the area uninhabitable for wildlife</td>
<td>Negative</td>
<td>Low</td>
<td>Recommendation to implement the following activities incorporated in the OT EIA:  ● Develop and implement a wildlife management and monitoring plan</td>
</tr>
<tr>
<td>13. Degraded soil</td>
<td>The Gobi fragile topsoil damage and clearance of vegetation making it impossible to be rehabilitated</td>
<td>No soil restoration measures are arranged in the evidence of damage of the soil by trucks and other</td>
<td>Negative</td>
<td>High</td>
<td>Implement the OT EIA recommendations  ● Initiate locally specific soil restoration pilot</td>
</tr>
<tr>
<td>Impact Areas</td>
<td>Nature of Impacts</td>
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<td>Nature</td>
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<tr>
<td>mine-related earth work</td>
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<td>activities with the involvement of local stakeholders, herders in particular</td>
</tr>
</tbody>
</table>

**Cultural Heritage**

1. **Lost and changed local cultural identity**
   - Local cultural identity, as a symbol of society, is one of the key patterns that unites a community and diluting and weakening local culture and its symbolic characteristics will be a huge loss
   - Although no verifiable evidence is being found, the likelihood is quite feasible
   - Negative
   - Moderate
   - Conduct an expedition to collect sources and ethnographic descriptions of important rituals and customs
   - Organize community awareness promotion activities:
     - local heritage festivals
     - conferences and consultation workshops
     - various contests and other public activities
   - Research living heritages as a documentary resource for local cultural heritages

2. **Increased disturbance of significant paleontological and archeological objects**
   - Illegal excavation and damage to immovable objects
   - Lack of a plan to integrate actions by stakeholders involved in studying and preserving cultural heritages
   - Negative
   - Moderate
   - Develop a general plan for OT Project impact area cultural heritage preservation towards integrated actions
   - Conduct survey on
<table>
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<tr>
<th>Impact Areas</th>
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<tr>
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<td></td>
<td>illegally excavated paleontological and archaeology sites during pre- and during project</td>
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<td>• Introduce regular cooperation with <em>soum</em> authorities on local cultural heritages</td>
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<td>• Support local handcrafting that can be competitive to replace original cultural heritage objects</td>
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<td>• Regular actions and training activities for mine workers and local stakeholders</td>
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<td>• Undertake a survey to verify any cases of breaking or ignoring local customs and traditions</td>
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<td>• Keep CR action plan updated</td>
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</tbody>
</table>

**Local Governance and participation**

<p>| 1. Increased activities by local NGOs and interest groups | Poor contribution of local NGOs to the development of responsible mining that recognizes local participation as a priority matter | The OT baseline survey revealed that NGOs and interest groups are less active and no effective interventions both by the | Positive | Moderate | • Promote local communities to participate and gain information on mine impacts through |</p>
<table>
<thead>
<tr>
<th>Impact Areas</th>
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<th>Nature</th>
<th>Significance</th>
<th>Proposed mitigation measures</th>
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<tbody>
<tr>
<td></td>
<td>locals and mines have been taken</td>
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<td>community consultation meetings and workshops and other public-oriented measures</td>
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<td></td>
<td>• Strengthen public-private partnerships and extend participation and voices of stakeholders and civil societies in local governance, decision making and public service affairs</td>
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<td></td>
<td>• Update community relation action program</td>
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<td>• Provide training and consultancy</td>
</tr>
</tbody>
</table>

**Pasture and Land**

1. Degraded and polluted grazing and water resources

<table>
<thead>
<tr>
<th>Nature of Impacts</th>
<th>Current status</th>
<th>Nature</th>
<th>Significance</th>
<th>Proposed mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poorly reversible damage and exhaustion of soil and pastureland, and contamination of water sources by mine trucks, infrastructures and other mine-related activities</td>
<td>Little is done to alleviate or reduce both causes and consequences of the potential impacts</td>
<td>Negative</td>
<td>High</td>
<td>• Participatory updates of Environmental management and monitoring program including land and other ecosystem components of the OT Project impact area</td>
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<td></td>
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<td>• Integrated mitigation activities in the framework the OT IDP integrated with aimag and soum land management</td>
</tr>
<tr>
<td>Impact Areas</td>
<td>Nature of Impacts</td>
<td>Current status</td>
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<td>Significance</td>
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</tbody>
</table>
| 2. Increased illnesses for livestock and wildlife | Sicknesses and disorders resulting from dust and other contaminating elements spread by mining activities | Mine-caused dust generation and no preference given by local veterinary services | Negative | High         | • Early completion of projects to build railway and hardtop roads as a part of OT and other mine projects infrastructure development program  
  • Develop and implement an environmental program involving other mines  
  • Training and demonstration of pasture restoration techniques and assisting local initiatives |
<table>
<thead>
<tr>
<th>Impact Areas</th>
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<th>Nature</th>
<th>Significance</th>
<th>Proposed mitigation measures</th>
</tr>
</thead>
</table>
| 3. Changed migration and mobility patterns among herder communities | Distances/routes and frequencies of seasonal migration for herder households changed | Little or nothing is done to reduce both causes and damage | Negative | High | - Undertake SIA on railway, hardtop roads and water pipelines  
- Jointly with other mines and OT Project impact area soums, develop and implement plan for relocation of affected households/properties and utilization of natural resources in the area affected  
- Training and demonstration on effective pasture management for both local authorities and herding communities |

the framework of the Socio-economic and Environmental Management Plan
### Appendix 1

## SIA TEAM MEMBERS AND SOUMS WORKED

<table>
<thead>
<tr>
<th>Soums</th>
<th>Name of SIA study team members</th>
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<tbody>
<tr>
<td></td>
<td>CPR</td>
</tr>
<tr>
<td>Dalanzadgad</td>
<td>Ts.Bolormaa</td>
</tr>
<tr>
<td>Khanbogd</td>
<td>B.Erdenebaatar, A. Boldsuukh, P.Lkham</td>
</tr>
<tr>
<td>Bayan-Ovoo</td>
<td>B.Erdenebaatar, A. Boldsuukh, P.Lkham</td>
</tr>
<tr>
<td>Manlai</td>
<td>B.Erdenebaatar, A. Boldsuukh, P.Lkham</td>
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<tr>
<td>Tsogttsetsii</td>
<td>B.Erdenebaatar, A. Boldsuukh, P.Lkham</td>
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</tbody>
</table>
WORKSHOP WITH SELECTED EXPERTS AND AC MEMBERS TO DEVELOP A LIST OF
POTENTIAL IMPACTS

Day 1: 22 April 2009, Wednesday

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0900-0915</td>
<td>Registration</td>
</tr>
<tr>
<td>0915-0925</td>
<td>Opening, introduction of participants</td>
</tr>
<tr>
<td>0925-0945</td>
<td>Explanation of Socio-Economic Impact Assessment Methodology – Catherine Macdonald, international adviser</td>
</tr>
<tr>
<td>0945-1100</td>
<td>• Oyu Tolgoi project overview - Keith Marshall, IMMI</td>
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<td></td>
<td>• Supporting infrastructure – descriptions and footprint, especially roads, transportation and water infrastructure - Shayne Paul/T. Munkhbat, IMMI</td>
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<td></td>
<td>• Investment, revenue distribution, employment and recruitment policy, accommodation plans for workers and procurement plans - Chad Blewitt, IMMI</td>
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<tr>
<td>1100-1130</td>
<td>Tea break</td>
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<tr>
<td>1130-1300</td>
<td>• Environmental impacts (from EIA), especially those with social impacts: noise, dust, air and water quality, management of hazardous chemicals – J. Oyunsuvd, IMMI</td>
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<td></td>
<td>• Relevant sections on draft Investment Agreement – Layton Croft, IMMI</td>
</tr>
<tr>
<td>1300-1400</td>
<td>Lunch</td>
</tr>
<tr>
<td>1400-1420</td>
<td>Overview of Baseline data for Oyu Tolgoi Project area and local perceptions on socio-economic impacts: preliminary findings and next steps – continued</td>
</tr>
<tr>
<td>1420-1440</td>
<td>Chair: Catherine Macdonald, International adviser</td>
</tr>
<tr>
<td>1440-1510</td>
<td>Methodology of socio-economic impact identification field survey – Ts. Bolormaa, PRTC/Erdenebaatar, CPR</td>
</tr>
<tr>
<td>1510-1540</td>
<td>Cultural Heritage – P. Lkham, CPR</td>
</tr>
<tr>
<td>1540-1610</td>
<td>Issues on Population – B. Enkhtsetseg, PRTC</td>
</tr>
<tr>
<td>1610-1640</td>
<td>Health Issues – A. Solongo/A. Navch, PRTC</td>
</tr>
<tr>
<td>1640-1730</td>
<td>Issues on Education – B. Naranchimeg, PRTC</td>
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<tr>
<td>1730-1800</td>
<td>Questions and discussion</td>
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</tbody>
</table>

Day 2: 23 April 2009, Thursday

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
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<tbody>
<tr>
<td>0900-0940</td>
<td>Local economy and standard of living – S. Amgaa, CPR</td>
</tr>
<tr>
<td>0940-1010</td>
<td>Employment – Ts. Bolormaa, PRTC</td>
</tr>
<tr>
<td>1010-1030</td>
<td>Socio-economic aspects of environmental impacts – E. Tumurbaatar, CPR</td>
</tr>
<tr>
<td>1030-1100</td>
<td>Natural resource use – B. Erdenebaatar, CPR</td>
</tr>
<tr>
<td>1100-1130</td>
<td>Tea break</td>
</tr>
<tr>
<td>1130-1200</td>
<td>Issues on public service – A. Boldsukh, CPR</td>
</tr>
<tr>
<td>1200-1300</td>
<td>Questions and discussion</td>
</tr>
<tr>
<td>1300-1400</td>
<td>Lunch</td>
</tr>
<tr>
<td>1400-1550</td>
<td>Group discussions in three groups: social issues/environment/economy</td>
</tr>
<tr>
<td>1550-1610</td>
<td>Tea break</td>
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<tr>
<td>#</td>
<td>Name</td>
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</tr>
<tr>
<td>1</td>
<td>A.Enkh-Amgalan</td>
</tr>
<tr>
<td>2</td>
<td>B.Erdenebaatar</td>
</tr>
<tr>
<td>3</td>
<td>E.Tumurbaatar</td>
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<tr>
<td>4</td>
<td>S.Amgaa</td>
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<td>5</td>
<td>A.Boldsuukh</td>
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<td>6</td>
<td>P.Lkham</td>
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<td>Ts.Bolormaa</td>
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<td>8</td>
<td>A.Solongo</td>
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<td>B.Naranchimeg</td>
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<td>10</td>
<td>B.Enkhee</td>
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<td>11</td>
<td>Navch</td>
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<td>12</td>
<td>Catherine MacDonald</td>
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<td>13</td>
<td>D.Dorjdari</td>
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<td>14</td>
<td>Bat</td>
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<td>15</td>
<td>Badarch</td>
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<td>Oyunmaam</td>
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<td>Dendevsamba</td>
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<td>18</td>
<td>Keith Marshall</td>
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<td>Layton Croft</td>
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<td>Chad Brewitt</td>
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<td>21</td>
<td>T.Munkhbat</td>
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<td>22</td>
<td>Shayne Paul</td>
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<td>Oyuusuvd</td>
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<td>24</td>
<td>Brock Gill</td>
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<td>25</td>
<td>Sanjtorj</td>
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<td>Oljmedekh</td>
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<td>Luke Distelhorst</td>
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<td>33</td>
<td>Khongorzul</td>
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</table>
## COMMUNITY CONSULTATION WORKSHOPS HELD IN UMNUGOVI AIMAG

**Venue:** Soum centre, Khanbogd soum, Umnugovi aimag  
**Date:** 10-11 June 2009, Wednesday-Thursday

### 09 June 2009, Tuesday

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>0900-0915</td>
<td>Pick-up and accommodation of participants from other soums</td>
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<tr>
<td>0915-0930</td>
<td>Dinner</td>
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</table>

### First day – 10 June 2009, Wednesday

**Morning Session:** Opening and Introduction of OT project  
Chairing – Dr. A. Enkh-Amgalan, CPR team leader

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tr>
<td>0900-0915</td>
<td>Opening and Welcome Introduction - Dr. A. Enkh-Amgalan, CPR team leader</td>
</tr>
<tr>
<td>0915-0945</td>
<td>Objectives and Methodology of the project – Catherine Macdonold, the international adviser</td>
</tr>
<tr>
<td>0945-1000</td>
<td>Introduction of the OT project (infrastructure, transportation, energy, investment, employment and local purchase) – Sanjdorj, Ivanhoe Mines Mongolia Inc (IMMI)</td>
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<tr>
<td>1000-1030</td>
<td>Tea break</td>
</tr>
<tr>
<td>1030-1050</td>
<td>Environmental aspects of OT project – J.Oyusuvd, IMMI</td>
</tr>
<tr>
<td>1050-1100</td>
<td>Q &amp; A</td>
</tr>
<tr>
<td>1100-1140</td>
<td>Lunch</td>
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**Presentation of the preliminary SIA Findings for OT Impact Area**

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>1400-1420</td>
<td>Methodological background of SIA – Ts.Bolormaa, PRTC</td>
</tr>
<tr>
<td>1420-1440</td>
<td>Cultural Heritage – B.Enkhtsetseg, PRTC</td>
</tr>
<tr>
<td>1440-1510</td>
<td>Population – Ts.Bolormaa, PRTC</td>
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<tr>
<td>1510-1540</td>
<td>Health – T.Navch, PRTC</td>
</tr>
<tr>
<td>1540-1610</td>
<td>Education – B.Naranchimeg, PRTC</td>
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<tr>
<td>1610-1640</td>
<td>Tea break</td>
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<tr>
<td>1640-1730</td>
<td>Q &amp; A</td>
</tr>
<tr>
<td>1730-1800</td>
<td>Review of the first day</td>
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<tr>
<td>1900-1930</td>
<td>Dinner</td>
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### Second day – 11 June 2009, Thursday

**Presentation of the preliminary SIA Findings for OT Impact Area - continued**

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<td>0910-0940</td>
<td>Economy and Infrastructure – A.Amgaan, CPR</td>
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<td>0940-1010</td>
<td>Employment – B.Enkhtsetseg, PRTC</td>
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<td>1010-1030</td>
<td>Socio-economic aspects of OT environmental impacts – E.Tumurbaatar, CPR</td>
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<td>1030-1100</td>
<td>Natural Resources and Agriculture – B.Erdenebaatar, CPR</td>
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<td>1100-1130</td>
<td>Tea break</td>
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<tr>
<td>1130-1200</td>
<td>Local Public Service – A.Boldsukh, CPR</td>
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<td>1200-1230</td>
<td>Q &amp; A</td>
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<td>1300-1340</td>
<td>Lunch</td>
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<td>1400-1550</td>
<td>Working group discussions in 3 groups: social &amp; demographic issues/natural resource &amp; environment/economy &amp; local development</td>
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<td>1550-1610</td>
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<td>Working group presentations</td>
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<td>1650-1720</td>
<td>QA &amp; comments</td>
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<td>1720-1730</td>
<td>Review of the II day</td>
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<td>1730-1750</td>
<td>Discussion of recommendations and next steps</td>
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<td>Closing</td>
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<td>1900-1930</td>
<td>Reception</td>
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Venue: Conference Hall, the Governor’s Office, Umnugovi aimag  
Date: 13 June 2009, Saturday

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<tr>
<td>0900-0915</td>
<td>Opening and Welcome introduction – A.Enkh-Amgalan, Team Leader</td>
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<tr>
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<td>Objectives and Methodology of the project – Catherine Macdonald, the international adviser</td>
</tr>
<tr>
<td>0945-1045</td>
<td>Introduction of the OT project (infrastructure, transportation, energy, investment, employment and local purchase) – Sanjدورж, Ivanhoe Mines Mongolia Inc (IMMI)</td>
</tr>
<tr>
<td>1045-1115</td>
<td>Questions &amp; Answer</td>
</tr>
<tr>
<td>1115-1130</td>
<td>Preliminary SIA Findings for OT impact area</td>
</tr>
<tr>
<td>1130-1150</td>
<td>Methodological background of SIA – Ts.Bolormaa, PRTC</td>
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<tr>
<td>1300-1400</td>
<td>Q &amp; A</td>
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<td>1400-1410</td>
<td>Lunch</td>
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<td>Cultural Heritage – B.Enkhtsetseg, PRTC</td>
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<td>Socio-economic aspects of environmental impacts – E.Tumurbaatar, CPR</td>
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<td>Economy &amp; Infrastructure – S.Amgaa, CPR</td>
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<td>Natural Resources and Agriculture – B.Erdenebaatar, CPR</td>
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<td>1540-1600</td>
<td>Local Public Service – A.Boldsukh, CPR</td>
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<td>1600-1620</td>
<td>Q &amp; A</td>
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<td>1620-1740</td>
<td>General Discussion</td>
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<td>1740-1800</td>
<td>Closing – by IMMI</td>
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Name of the participants in the workshop held in the Dalanzadgad soum

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<tr>
<td>1.</td>
<td>B.Badraa</td>
<td>Aimag Governor</td>
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<tr>
<td>2.</td>
<td>B.Tuvshinbayar</td>
<td>Head, Dept., of Governor’s office</td>
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<tr>
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<td>KH.Jamyankhorol</td>
<td>Officer, Dept., of Social development</td>
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<td>Officer, Dept., of Social Policy</td>
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<td>Senior officer, Dept., of Food and agricultural policy</td>
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<td>A.Dargakhuu</td>
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<td>94.</td>
<td>Batkhuyag</td>
<td>Unemployed</td>
</tr>
<tr>
<td>95.</td>
<td>Khenchbish</td>
<td>Teacher, Kindergarten # 11</td>
</tr>
<tr>
<td>96.</td>
<td>Amartuvshin</td>
<td>Employee, “Altan gobi” TV</td>
</tr>
<tr>
<td>97.</td>
<td>Ajiltan</td>
<td>Employee, “Gobi Orgil” cooperative</td>
</tr>
<tr>
<td>98.</td>
<td>Tsetsegmaa</td>
<td>Employee, “Gobi Orgil” cooperative</td>
</tr>
<tr>
<td>99.</td>
<td>Ariunbold</td>
<td>Employee, “Science key” NGO</td>
</tr>
<tr>
<td>100.</td>
<td>Gishuun</td>
<td>Employee, “Science key” NGO</td>
</tr>
</tbody>
</table>
Presentations of CPR/PTRC SIA study team

<table>
<thead>
<tr>
<th>Impact Area</th>
<th>Baseline Survey Findings</th>
<th>Potential Impacts</th>
<th>Local Views and Perceptions about Potential Impacts and their Justifications</th>
</tr>
</thead>
</table>
| 1. Pasture and pastureland | • Pastureland take associated with mining and infrastructure development  
• Activities on land has been allocated to citizens and herders for ownership and possession and seasonal pasture has been contracted to herder groups and *khot ails* have been well underway in all *soums* | • Increased dust generation and dust spreading in around OT and along roads may reduce the size of pasture  
• Pastureland take associated with construction and operation of project and building road and energy infrastructures | • Impacts of dust are: 1. The size of land for animal grazing or pasture has been diminished by a strip 280 km long and 5 km wide; 2. Decline in the pasture forage production; 3. Vegetations in dust-affected area have been replaced noticeably by non-palatable and weed plants  
• In the long run, taking land out of pasture areas for railway, autoroad and other infrastructures will continue making pastureland lesser than before  
• With newly build roads, some traditionally used pasture and water sources may cut off from the other parts on alternative side of the roads, etc.  
• Herders might enjoy special support from mines as response to pastureland take | • Businesses and activities in OT and areas of cumulative impacts that are linked with land and land rights may be directly and indirectly  
• Imprisonment and hygiene of products deriven from vegetable growing and animal farming in the OT affected areas  
• Land take vs. interests and potentials of local people and enterprises to run activities for additional and business income generating  
• Needs may arise to re-setle permanently located and operated constructions and businesses  
• Needs to re-draw boundaries of or re-distribute pastureland used or contracted by herders and herder groups on informal and formal basis  
• Violations of legal rights of local citizens to use, posses and own land may occur and cause disputes and claims to be reimbursed  
• Rights to own, possess and use land may be burdened  
• Disputes on land rights between local citizens and the mining companies may rise  
• It is potential that citizens and entities may claim on reimbursement of costs associated with land take  
• Perceptions and attitudes of local citizens towards allocation of land to immigrants and illegal arrivals  
• Sensitive and poorly welcoming attitudes to allocation of land and grazing areas resettled indigenous and immigrants households if they cause problems to the entire livestock community or part of it (such feeling with Energy Resource LLC is evident in the Tsogttsetsii *soum*) |
<table>
<thead>
<tr>
<th>2. Potable and animal water</th>
<th>3. Land and crop activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>* 90% of herder households relay on shallow wells</td>
<td>* Local people/herders believe that they would be able to produce more if opportunities to supply to OT and other markets occur</td>
</tr>
<tr>
<td>* People worried about contamination of water by foreign materials</td>
<td>* Small land suitable for cropping vs. local willingness to</td>
</tr>
<tr>
<td>* Physical and chemical pollution of water sources caused by sedimentary dust, various chemicals and fuel</td>
<td>* Local livestock producers are sure that they happy to respond to OT demand and requirements</td>
</tr>
<tr>
<td>* It has been common in all affected areas that wells are badly contaminated by dusts</td>
<td>* Local herders (somewhere called local livestock producers) believe that they have capacity and conditions to produce and supply meat, milk and other products that meet the requirements of the mines</td>
</tr>
<tr>
<td>* Truck drivers and travellers lift water from wells with dirty vessels, wash their cloths and other stuff baskets for lifting water and dispose various litters nearby wells</td>
<td>* The mines treat products herders produce unrealistically that they are unhygienic and prepared in unsafe environment and livestock are not all healthy</td>
</tr>
<tr>
<td>* Heavy trucks severely damage and degrade soils nearby wells by which pollution of wells has been increasing</td>
<td>* No information on the types, quality and quantity, and the time when the mines want, is not available</td>
</tr>
<tr>
<td>* Drivers and people break hart, cap and other structures of wells which may create unsafe and unhygienic conditions of both potable and animal water</td>
<td>* Local livestock producers have no simple idea regarding the conditions they could keep up to supply their products to mines and the internal rules and specifications the mines pursue</td>
</tr>
</tbody>
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<thead>
<tr>
<th>Depletion of underground water table</th>
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<tbody>
<tr>
<td>* As herders assume, the level of water in shallow wells has been lowered by 30-50 cm. There is common perception and worry in all soums this would worsen even greater if the large water consumption by mines begin</td>
</tr>
<tr>
<td>* The rate to which the water level depleted has been larger over the last two years regardless better rain in summer (all herders comment unanimously)</td>
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<thead>
<tr>
<th>Reduced water in wells</th>
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<tbody>
<tr>
<td>* The depth of lifting water has been increasing /consumes more time and fuel, livestock spend more time and drink less and this may worsen and many wells may become unreliable as source for water as years go)</td>
</tr>
<tr>
<td>* Poor water availability makes livestock remain thirsty everyday</td>
</tr>
<tr>
<td>* The water level fails to stock up overnight</td>
</tr>
<tr>
<td>* Herders do not clean the accumulation of earth and sediments and keep wells protected from getting sand and earth in</td>
</tr>
<tr>
<td>4. Agriculture sector productivity</td>
</tr>
<tr>
<td>-----------------------------------</td>
</tr>
<tr>
<td>engage in crop growing</td>
</tr>
<tr>
<td>Increased crop activities vs. poor crop technology</td>
</tr>
<tr>
<td>All crop activities will unavoidably require to be irrigated. This would challenge to take care of both water and soil. Blind irrigation may cause saliniton of cropland as a result of mass attempts to grow vegetable and feed crops</td>
</tr>
<tr>
<td>The local specialists recognize two things, which are: (i) small size of land suitable for crop; (ii) crop production in the OT area to be practical and soil-protecting, it will require introduction of technologies which highly efficient in terms of soil protection and water saving</td>
</tr>
<tr>
<td>Problems associated physical and mental mismatching quality and hygiene of local products with high standard and consumer preference</td>
</tr>
<tr>
<td>Seasonality and fewer crops vs. demands of mines</td>
</tr>
<tr>
<td>For the OT areas, opportunities exist to run specialized cash crops or field vegetables along with growing fruits</td>
</tr>
<tr>
<td>Poor and unreliable supply/availability of energy and water, and limited access of herders to cell phone service</td>
</tr>
<tr>
<td>Inability of households and people known as small users outside soum centres to access infrastructures and services</td>
</tr>
<tr>
<td>Khanbogd people seem very unhappy that the Khanbogd centre is still on hours of electricity cut offs /commented that OT’s promises to help since its operations - over 6 and more years have not been come true/</td>
</tr>
</tbody>
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<thead>
<tr>
<th>6. Local business development</th>
</tr>
</thead>
<tbody>
<tr>
<td>- <strong>Soum</strong>-based services are largely monomial dominated by trading, poorly diverse, and poorly cooperative to compete with external presence</td>
</tr>
<tr>
<td>- Increased competition for limited markets may cause insolvency among poor businesses and service providers</td>
</tr>
<tr>
<td>- Capacity to respond to markets development improved</td>
</tr>
<tr>
<td>- Mental expectations towards support of local businesses through local procurement and other means</td>
</tr>
<tr>
<td>Opportunities for diversifying and expansion of businesses may occur</td>
</tr>
</tbody>
</table>

| - OT and other mines have been poorly active to bring cell phone service coverage close to non-urban population, namely herders. People raise this issue because they worry about needs to have reliable communication in sign of increased illness among people and livestock, unsafe traffic and frequent accidents and increased |
| - High costs in post project period to maintain and keep in operation of infrastructures created during mine lifespan |
| - Not everybody is worried about that no big problems would arise with the maintenance of infrastructures after mine closure – all will be strongly connected to national and regional networks |
| - People comment that no thoughts are made about making infrastructures to be created newly accessible to a large number of consumers and users |

<p>| - The mines is advised to inform local service providers about conditions and requirements they want and work together |
| - Local businesses and services stay poorly sensitive and less initiative towards serving the mines since nothing about the needs and requirements of the mines in services is made clear |
| - If mines do not procure local products and services, nothing would change and no benefits from large mines will be locally expandable. Our comment – the extent of local development will depend on how mines will behave. |
| - Support of development of production and services operating in areas affected by OT and other mines is direct responsibility of the mines. It seems that mines think what they have been doing. Instead, think about what could be done better if other companies were. |
| - If the mines bring lots of services from other areas for its own interests, for example from Ulaanbaatar, none of us – local businesses will develop – all will bankrupt and pushed out |</p>
<table>
<thead>
<tr>
<th>7. Finance and banking</th>
<th>Needs to protect local markets will increase</th>
<th>**Nothing is known if **soum <strong>,</strong> mines and businesses have talked and worked out common strategy and policy for both **soums <strong>and mines towards penetration of businesses from non-OT affected areas</strong>&lt;br&gt;<strong>Poor capacity of local businesses to compete with large businesses is main worry for <strong>soum</strong>-based businesses</strong>&lt;br&gt;<strong>If local businesses are allocated/provided conditions and opportunities to diversify, all markets they now occupy will be concurred by others</strong>&lt;br&gt;<strong>We wish the mines bring experts highly-experienced in mining-local business interactions and cooperation to develop <strong>soum</strong>-specific strategies</strong>&lt;br&gt;<strong>If the mines were to support local businesses, they should meet and consult with us. No scheduled mining-local business meetings and feedback consultations are hold</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Resettlement and compensation</td>
<td><strong>Predominant consumer loans</strong>&lt;br&gt;<strong>Low monetary saving and accumulation by citizens</strong>&lt;br&gt;<strong>Branches of banks operating remains</strong></td>
<td><strong>The mining would indirectly and favorably affects on improvement of local banking services</strong>&lt;br&gt;<strong>Consumer loans would decline if business and services towards supply of mines expanded and benefits of citizens from the mines increased</strong>&lt;br&gt;<strong>Low interest and late maturing loans would encourage lending</strong>&lt;br&gt;<strong>Herders and livestock keepers may experience severe hits if banks change their policy to accept livestock as potential collateral</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Willingness and capacity to accept requirements for collators banks offer</strong></td>
<td><strong>Increased pressure on fewer bank branches operating in <strong>soums</strong></strong>&lt;br&gt;<strong>The conditions that would support increased savings are: (i) employment in mines, 2. Sell local products to mines; 3. Develop services to serve mines</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Increased pressure on fewer bank branches operating in <strong>soums</strong></strong>&lt;br&gt;<strong>Increased bank savings</strong></td>
<td><strong>Banking service in OT affected areas would develop if the mines helps local citizens and business to advance in the accumulation of monetary wealth</strong>&lt;br&gt;<strong>Reduced private or non-banking lending will make banking service expanded</strong></td>
</tr>
<tr>
<td></td>
<td><strong>To benefit from mining, people, especially those involved in herding have to make decision - herding or</strong></td>
<td><strong>Many herders and members of herder families may give up herding making the competition for jobs in the mines</strong>&lt;br&gt;<strong>Herders would give up herding for two reasons: (i) if they hired for long-term employment or just to find work in mines. Thus, many local people would face uncertain and poorly alternative choose to either keep attempting mines or return to herding</strong>&lt;br&gt;<strong>The commitment of, and opportunity for, those who gave up herding to work in the mines would be significantly diluted. Therefore, hiring local people by the mines touches upon the most fragile issues of livestock production and rural livelihoods</strong></td>
</tr>
</tbody>
</table>
| working for mines | Cases to resettle families and their immobile properties may occur resulting from needs of land take for new developments | • In connection with establishing infrastructures, probability of resettlement is equally expected in both in soum centres and rural areas  
• With building new infrastructures such as roads and electricity lines, and start construction of new mines in areas where work of licensed exploration is being conducted, herders may be forced to move and re-settle. OT has resettled 11 families and Ukhaa Khudag mine plans to resettle 12 families out of its mine site. The mines should be careful to say no more resettlements will occur  
• Based on data available some years ago, soums have developed a plan for land ownership and possession at their centres. By now, some 100 families came outside have submitted their request to get land in the Khanbogd centre. This kind of unplanned/unforeseen land tenure has been popular in Khanbogd and Tsogtsetsii soums where more migration of people occurs. |
| No resettlement is anticipated except for herder families already compensated for loss of winter pastures. However, other cases where herders and citizens loss land and other immobile properties to claim | Mini-initiated resettlement would require large quantity of labor and sources to be released by not only the mines, but also the resettled will have to. | • The mines make best efforts to keep resettlement and displacement of families and constructions to minimum  
• Citizens who find less or impossible to stay at their indigenous areas may claim resettlement  
• It would be hard for herders and citizens to release source for resettlement herders, if do so, their viability may become more fragile  
• Resettlement of herder households, when they had no certificate of possession of the land underneath of winter and spring camps, costed less. However, claims for land take and resettlement would require new situations to be fully reimbursed  
• Because not enough space for unpredicted resettlement, the resettleds may need to pay hosts |
| Probability of raising conflicts between mine workers and soum citizens | • No direct conflicts will occur, since camps are protected.  
• The mines may organize visits by the locals to the camps since many people claim that they have no simple ideas how the camps look like and how people live there  
• Instead announcing nice things are expected to be built and constructed, the mines may pursue another strategy to make local people more familiar with the conditions and requirements of new plants and pits. This will help people acquire knowledge and understand what the new developments will require from them |
9. Changes in the social structures and relations

- Local citizens and communities perceive that immigrations and penetration of various cultures will affect social structures and relations to change.

- Social structure and relations may be affected by the immigration and urbanized lifestyle.

- Arrival of people from many different places have good impacts that our people marry them and on social norms. However, there arrive people (with different behavior and low-educated and wrongly-minded) expose local people to bad habits (people comment that such bad examples are already found in Khanbogd and Tsogtsetsii soums).

- Widened gaps in wealth status forces emerging a social layer with such manner of social relations and responses.

- Social impacts of concentration of people in soum centres and mine camps.

- It is expected that families will be moving to soums centres (potential reasons may be to long stay at soum centre attend schoolchildren, own land, build new houses and constructions at soum centres are). In addition, it seems that the syndrome to close up to centres may re-emerge. The social impacts of such phenomenon would be: (i) seasonal overconcentration of people with high peaks in winter-spring; (ii) competing to acquire better parts of the land at soum centre. Old days, people had talked about getting land in Ulaanbaatar and aimag centres. Now land acquiring at centres of mine-rich soums becomes fashion and challenge for many people; (iii) large settlements challenge producers and service providers to locate close as possible. These patterns will increase.

Changes in the employment and household livelihood and life cycle (working on long shifts and change in attitudes and care for household life and children, etc.)

- Working on long shifts (56 days in OT, 10 days in Entrée Gold, 14 days in CIS) will affect normal household life and its cycle.

- If such long-term working shifts are maintained, it would be hard to oversee who is coming and who has gone.

- Unmarried young people who worked/is working in mines finds spouses, which is good (3-4 young people from Bayan-Ovoo who worked at the Coking plant married).

- Measures to cease prostitution in Tsagaan Khad through check-ups of the trucks on coal transportation roads and on-site unannounced examinations have been efficient.

- Local citizens expect benefits from increased local budget revenues as a result of contributions of the mines.

- Soum budget revenue has been and will increase thanks to increased contributions of mines.

- Contributions, the mines bring to local budget are well known and interpreted by individuals, because the benefits do not directly come to them. Therefore, people recommend that the mines should take measures on information disclosure: what and how much contributed when, how much should be attained for soum budget.

- People misperceive that increased soum budget will immediately bring benefits.
  - increased social benefits and pensions
  - immediate improvement in the school and hospital
  - all people are to benefit in equal access.
## 10. Local economic development

<table>
<thead>
<tr>
<th>Process of expansion of local business and increased business competition</th>
<th>Should local business and markets is to expand will directly depend on policy and actions by the mines toward supporting local economy. No support by mines means for us no business to develop.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interdependence and integration between extended tax base and business expansion</td>
<td>Development of local businesses in response to positive impacts of mining will expand tax base which would be therefore, an important source for increased local budget revenue.</td>
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</tbody>
</table>

### Improved local government functioning and governance

<table>
<thead>
<tr>
<th>Needs for creating and maintaining favorable local business development environment and possibilities for their implementation</th>
<th>Soum government would be challenged to create favorable environment if it is to support local business to develop in response to favorable support and assistances provided by the mines.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional pressure on soum public service will occur to be managed jointly by the mines and local government</td>
<td>Strong and transparent partnership with the mines and soum authorities and citizens will be needed.</td>
</tr>
</tbody>
</table>

Many favorable results related to the effective development of local business will be achieved if local government and the mines will held regular consultation and cooperation. More pressure on budgeting is expected to be firstly brought on soum school and hospitals resulting from increased immigration and population growth. Soum governor’s office will experience increased pressure because of immigration of large number of households and emergency of new businesses and penetration of outsiders’ businesses. School and hospital would experience shortage of budget if many schoolchildren and hospital patients arrive during fiscal years (budget is approved once at the beginning of each fiscal year). Increased out-migration of citizens and schoolchildren from some soums, for example Manlai and Bayan-Ovoo may result in budget cut down over the forthcoming years making harder schools and hospitals to survey.
Role and participation of local citizens, entities and other stakeholders in environmental protection and conducting efficient environmental monitoring

On our side, we, people in soums of OT impact area have been always talk and complain about increased dusts and degraded pasture and the companies keep promising dust will be suppressed. However, nothing has been done and any achievements have made other than talking

All currently emerged positive and negative environmental burdens associated with mining such as dust generation, pasture degradation and others, should be assessed jointly by the mines and local government and local NGOs/interest groups to generate justifiable information

Soum take initiatives and come up with proposals to the mines and take actions in framework of existing laws and regulations and organize measures to promote

Local policy to arrest setbacks caused by and resulted from mine closure

Not many comments and perceptions made because people do not clearly understand and prospect what does mine closure means. However, the mines will not be deadly closed and be stopped all one day. Thus, local government and mines must work hard tens of years before the mine closure to ensure better mitigation.

Everybody and every family and entities should kept working hard to find way to be affected lesser

2 SOCIO-ECONOMIC ASPECTS OF ENVIRONMENTAL IMPACTS

<table>
<thead>
<tr>
<th>Impact areas</th>
<th>Findings of the Baseline Study</th>
<th>Potential Impacts</th>
<th>Local Perceptions</th>
</tr>
</thead>
</table>
| 1. Air Quality | Dust concentration is higher near Tavan Tolgoi Coal Mine and along the road from the mine to the Gashuun Sukhait border point | • Increased dust emissions during road upgrading and construction  
• Air contaminated by dust  
• Increased respiratory system diseases  
• Wells used by herders for potable and animal water contaminated by dust  
• Grasses covered by dust and do not grow well | • Dust impact the amenity of residents living near transport route. Dust from vehicles raise always. They smell dust and vehicle emissions and they could not see distant sight.  
• The dust badly contaminates the air  
• Dust affects health of people and causes respiratory diseases, allergy also nervous system disease and disease caused by unclean hands have been recorded and they think that these disease will increase in the future  
• Dust is carried to the distance 10 km by the wind  
• Grasses covered by dust and growth is suppressed  
• Dust goes into herder wells and contaminates water |
| 2. Noise | Noise emissions from vehicles/construction may impact the amenity of residents living near transport route and sites | Noise emissions from vehicles during night time makes people nervous and resting poorly
- Noise from vehicles does not expected to be interrupted because of constant move of many trucks
- It is difficult to rest and sleep when trucks go unloaded
- It is obvious that how undesired clattering sounds of vehicles and fully-loaded engines would affect health of people and how it will be hard for people lacking good sleep and feeling unpleasant.
- Noises from vehicles are caught as far as at about 20 km
- Noise emissions are not suppressed any longer unless the coal forwarding is completely halted or significantly reduced |
| 3. Light from vehicles | Accidents may occur during night caused by truck lights | The lights from vehicles during night are dangerous that people and livestock may hit by truck
- If 100 new trucks are added when the Ukhaa Khudag mine starts coal transporting, the road will become like a modern city night street |
| Water resources | Data of surface and ground water aquifer | The current level of wells water may decrease
- Decreased yield of wells
- Springs may dry up
- Decline drinking and animal water supply
- Wells contaminated by dust
- The level of wells water has been decreased caused probably because of warming and dryness
- The water level of hand wells near the aircraft take off strips which are being constructed in Tsogttsetsii soum has been lowered after a water drainage to lay out a building base
- Well caps, house and fence frequently broken, thus making water subjected to continues pollution and unsafe
- According to herder’s estimation, the water level of hand wells has been depleted by 30-50 cm. There is concern that if mines begin consuming ground water in larger quantities, it may affect hand wells in each soum
- According to herder’s observation, the level of hand wells water has been decreasing over the last 2 years despite more rainfall.
- Depth of pulling out water from wells has been increasing. There are worries such as livestock do not have enough water, more time and fuel are spent for animal watering, herders expect that situation may change from bad to worse in the future |
<table>
<thead>
<tr>
<th>Section</th>
<th>Key Points</th>
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<tbody>
<tr>
<td>5. Soils</td>
<td>- Soil types and distribution</td>
</tr>
<tr>
<td></td>
<td>Soil degradation caused by exceptional and unpermitted diverting the main roads</td>
</tr>
<tr>
<td></td>
<td>Trucks create subroads damaging a wide area of land leading to accelerated and irreversible soil degradation</td>
</tr>
<tr>
<td></td>
<td>Soils around wells have been degraded by heavy trucks</td>
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<tr>
<td>6. Wildlife</td>
<td>- Wildlife and distribution of some rare animals</td>
</tr>
<tr>
<td></td>
<td>Wildlife migrated because of noise emissions from vehicles</td>
</tr>
<tr>
<td></td>
<td>Noise from vehicles caused immediate migration of wild animals to less disturbing areas</td>
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<tr>
<td></td>
<td>Although pasture and water is still available, no wildlife returns to their indigenous habitat areas. No asses and gazelles are seen</td>
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<tr>
<td>7. Vegetable production</td>
<td>- Vegetation type/distribution</td>
</tr>
<tr>
<td></td>
<td>Grasses do not grow well</td>
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<td></td>
<td>Declined pasture feed resources and carrying capacity</td>
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<td></td>
<td>Increased sand drifts</td>
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<td></td>
<td>Species composition of indigenous vegetation of pasture has undergone tremendous changes</td>
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<tr>
<td></td>
<td>Grass yield has been declining</td>
</tr>
<tr>
<td>8. Mine closing/rehabilitation</td>
<td>- Job loss</td>
</tr>
<tr>
<td></td>
<td>Create new job</td>
</tr>
<tr>
<td></td>
<td>Concerns of rehabilitation do not done</td>
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<td></td>
<td>Local government has to take measures as earlier as much to prevent and reduce unpleasant consequences that may occur after the mines are closed</td>
</tr>
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<td></td>
<td>Each person, household/organization to work hard towards better survival strategy</td>
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<td></td>
<td>First of all, the local should work hard to keep working or develop better skills for jobs available:</td>
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<td>- Obtain qualification to be hired by other mines</td>
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<td></td>
<td>- Create fixed living source</td>
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<td></td>
<td>- Buy fixed assets in other aimag</td>
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<td></td>
<td>Mines should intervene and provide assistance in rational solving and implementing above mentioned postproject survival strategies</td>
</tr>
</tbody>
</table>
9. Visual impacts

- Natural ecosystems will be changed
- Concerns that sites that underwent changes never be fully rehabilitated to the pre-project native composites
- Our eyes will never find the mine-made changes to our native areas as native as it was before.
- No concrete comments can be made since we have no comprehensive ideas at all what does restoration mean and how it is made
- If the mines demonstrate what they can restore damaged and disturbed land, we may get more knowledgeable and familiar to comment at later stage
- Local people do not expect the environment will be completely rehabilitated
- They suggest of thinking to create other composites on that land where the mines are: construction of artificial ponds and oasis or recreation areas, etc. These would be more acceptable by people and more enjoyable and pleasant than re-filling dams and pits/holes

<table>
<thead>
<tr>
<th>Impact Area</th>
<th>Baseline Survey findings</th>
<th>Impacts</th>
<th>Local Perceptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Infrastructure of educational institutions</td>
<td>- Educational institution infrastructures are poor. Particularly, toilets, washing rooms, water supplies, telephones, fax machines and internet networks are inadequate.</td>
<td>- Impacts on educational infrastructure and capacities of the dormitories</td>
<td>- During the last years capacities of kindergartens and secondary schools have been exceeded due to the migrant families (with children) to Umnugovi aimag in order to work at Oyu Tolgoi or Tavan Tolgoi mining site. Accordingly, future trend of the first grade enrollment will be increased. When OT mine starts the capacities of the kindergartens and schools will not met the demand. - Locals are expecting to have 24 hours electricity when OT starts its mine. - Directors of educational institutions are planning to write a proposal to improve infrastructure of school to OT. - Pupils who need to live in dormitory will increase if OT mine starts.</td>
</tr>
</tbody>
</table>
| 2. Education level and literacy rate | • OT area’s educational level is lower than aimag average  
• There are no opportunities to improve education level in the soums. | • Perceived impact on population education level  
• More opportunities to obtain education | • Many people with different education level will come to Umnugovi aimag.  
• Secondary school students/young people would like to attend a mining professional orientation training in order to be hired at OT/Tavan Tolgoi project.  
• OT project is implementing educational program for students. According to this program students who live poor households have had more opportunities to study at universities and get higher education.  
• English language program which organized by OT had influence to population english knowledge level. Locals are expecting future training.  
• Locals are expecting to organize OT informal trainings (on health, law and market economic) to young people whom dropped-out during the 1990’s years. |
| --- | --- | --- |
| 3. Availability of educational facilities | • Educational instruments, books, libraries, laboratories and other course materials are inadequate. | Impacts on educational instruments and other course materials | • Poor households have inadequate facilities to buy textbooks. It would be a good support if OT could help on that matter.  
• Capacity of kindergarten and schools would need to be calculated by estimating migration flow because of current capacity would not met the need.  
• Directors of educational institutions are planning to write a proposal to improve basic instruments, books and other training materials to OT.  
• Director of the Vocational and professional training center has send his proposal to OT and waiting reply. The proposal was on having technical assistance for professional practice. |
| 4. School enrolment and participation rates | • Preschool enrolment ratio is lower than aimag average.  
• Teachers who hold professional degree are few.  
• Drop out rate of children aged 7-15 is higher | Perceived impacts on school enrollment and participation | • If young couples work at mining site more children aged under 6 years old would attend kindergartens.  
• Children per teacher in the kindergartens will increase.  
• Kindergartens for children under 2 years old will need to be opened.  
• School and kindergartener’s enrolment ratio are possible to increase if OT project support educational institutions to improve their capacities. |
<table>
<thead>
<tr>
<th>than aimag average. ○ Availability of the Vocational and Professional Training Center is not enough.</th>
<th>School drop-out rate</th>
<th>○ There is a risk that child aged 6-15 may dropped-out of school and to take care their livestock if their parents work at OT project. ○ Migrant workers” children aged 6-15 may dropped-out due to their parents” carelessness. ○ School drop-out will decrease if OT project support the activities to improve health of the children who dropped-out by health reason.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional degree teacher’s supply</td>
<td>○ Some teachers who work at secondary schools in Umnugovi aimag want to work at OT project to earn more salary. ○ OT project could influence to eliminate the shortage of adequate number of teachers by supporting students whom would like to be a teacher. ○ OT has implemented a project to encourage (housing, social support etc) doctors to work at local level. Locals are expecting same project for teachers.</td>
<td></td>
</tr>
<tr>
<td>Vocational training center</td>
<td>○ Vocational and Professional Training Center needed to be expanded by having a mining professional classes. ○ To establish new Vocational and Professional Training Center in Khanbogd soum.</td>
<td></td>
</tr>
</tbody>
</table>

### 4 HEALTH

<table>
<thead>
<tr>
<th>Impact area</th>
<th>Key findings of the baseline survey</th>
<th>Impacts</th>
<th>Perception of the local people</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>● The incidence of communicable diseases has increased.  ● Number of disabled people are increased in some soums.</td>
<td>● <strong>Access to health care services and type</strong>  - Impacts on facilities of soum hospital, service delivery coverage, type and quality of services.</td>
<td>- Due to increased population density caused by in – migration process access to health service will be decreased;  - Health organizations will be over loaded and shortage of health facility, equipment and human resources, in particular that is true for Khanbogd;  - Even though there was built a new hospital in Aimag centre it still in lack of specialized sections and specialized doctors, in particular in injury, gynaecology and diagnosis;</td>
</tr>
</tbody>
</table>
| • High respiratory system diseases leading morbidity and circulatory system diseases is lead cause of mortality. | - Since there has been more focus on delivering of quality health service for soum population and in – migrants there a probability for people from remote not have an adequate access to the quality health service;  
- More population may not affect access to health service; however, it will certainly affect its quality. |
| Percentage of diarrhea among children aged 0-5 was high. | - More population will increase workload of medical personnel; therefore, basic health care services delivery will be faced difficulty among temporary migrants and unregistered residents.  
- In the last few years below described diseases and sickness has been showing tendency to spread:  
- Occurrences of accidents and cases of contamination have become more often because there were established many mining sites. Occurrences of accidents involving vehicles also have become more often;  
- Local people have become more vulnerable to cardiac and blood vessels diseases;  
- Local people have become more vulnerable to allergic reaction and breathing problem due to dust;  
- Local people have become more vulnerable to minor respiratory ailment;  
- Due to in – migration process cases of STIs, cases of syphilis have increased in particular. Workers from China do not get medical checkups  
- Occurrences communicable diseases such as TB and hepatitis A have increased;  
- Employees from different regions poorly able to adapt to the Gobi climate being vulnerable |
| Adolescent births is high.  
- Persistently decreased infant mortality rate vs. increased prenatal mortality  
- Incidence of STIs is increased.  
- Rate of contraceptive use decreased.  
- The risk of STIs/HIV/AIDS is high. | - In last 5 years, number of the disabled children have increased.  
- Due to increased population growth, social welfare services will faced more difficulty.  
- Due to centralized, fertility of vulnerable mothers/couples will be increased.  
- Child morbidity and mortality will be increased because of lack of mother’s nutrition.  
- Due to increase in – migration process incidence of STIs/HIV/AIDS will be increased. In fact, that majority of employees are young people and foreigners. At the same time, prostitution will be increased. While, abortion will be increased and negative impact of abortion will be raised. |
### 5 POPULATION and EMPLOYMENT

<table>
<thead>
<tr>
<th>Impact Area</th>
<th>Baseline Result</th>
<th>Potential Impacts</th>
<th>Local perceptions and their justifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
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<tr>
<td></td>
<td>● Percentage of children and youth is high among population</td>
<td>● Population age and sex structure</td>
<td>● Associated with the expectations of employment creation and the development of service industries, it is likely that the mining will encourage a population concentration nearby.</td>
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<tr>
<td></td>
<td>● Balanced sex ratio</td>
<td>● Population resettlement</td>
<td>● Locals are expecting that the population of Khanbogd soum (Umnugovi aimag) will be increased due to in-migration and will result in population concentration.</td>
</tr>
<tr>
<td></td>
<td>● In/out migration is low</td>
<td>● Families, intra household dynamics, nature of mining employment (divorce, intra household relationship etc)</td>
<td>● There are increasing tendency of in-migration due to employment sources of hiring locals. Single person as well as family group migration are increasing.</td>
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<tr>
<td></td>
<td>● Percentage of female headed households are relatively high</td>
<td></td>
<td>● Locals concern about the carrying capacity (water, grassland, grazing, pasture and settlement) issues of Umnugovi aimag particularly for Khanbogd soum.</td>
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<td></td>
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<td>● Regarding the family relationships, locals consider that the family members could be separated because of mining employment, which could have impact on intra-household dynamics.</td>
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</tbody>
</table>

- All soums have problem with drinkable water supply and it has become the priority to address;
- Water “hardness” is causing kidney disease;
- There is no technology to soften water is used;
- There was less conducted a proper research on water content. Research should be conducted in order to assess how water elements are being changed;
- Conducting mining operations at drinking water sources is very damaging;
- They are not giving any safety guarantee;
- Dust generation is getting too much in any part of the OT area;
- There are not any green establishments;

- Food is not safe. Laboratory inspection for food products is not adequate. There are not any devices and equipment to test food products on spot;
- There are no adequate warehouses or storages for food products;
Female headed household could be increased at aimag and project area soums.

2. Employment

- High unemployment rate
- Labor force participation are different by age and sex
- Locals’ skills are low
- Limited employment source
- Limited local employment creation

- Possibilities to hire locals and training in mine-related jobs
- Positive and negative impacts hiring outsiders
- More employment sources and possibilities to work mining area and service sector
- Gender impact on labor force participation

- Locals have a high expectation of employment. Obviously, employment creation will influence to high unemployment rate. 400 people from Khanbogd soum have registered to be employed by OT but not many been hired. Someway, this is due to the OT has not started their operation yet. Currently, only 5 people are working at OT company office and around 100 locals are working at OT contracted CSI catering company as a firefighter, cook, servant and cleaner. Locals pointed that their skills are not fully met the requirement.
- Companies such as Olon Ovoot, which operate mining at the Khanbogd soum also, do not hire locals much saying the locals have, low skill. Therefore, locals would like to be trained.
- OT provides educational opportunities for talented youth to receive education and training.

3. Incopna/Livelihoods

- Local budget is not enough
- Local economic sector activities are limited
- Limited income source

- Impact on local budget
- Impact on local economy, particularly on local economic sector activities

- Local loyalty/income from tax will be expanded. Social insurance will also be increased. However, the problem occurs as most of the mining companies have registration at Ulaanbaatar. Social insurance and natural resource use tax will be increased when those companies are registered at aimag.
- Umnugovi aimag must pay 6.9-7 billion MNT to state budget per year. 85 percent of aimag budget composed by mining company tax (only 4 companies make budgetary contribution and 2 companies will be included from this year), which shows locals budget heavily depends on mining sector.

- Local supply chain (milk, meat and food items)

- Water extraction payment is an issue. Companies pay only 0.8 MNT per liter water. If this payment continues in the future, it would be economically inefficient.
- Economic sectors rather than mining should be expanded. Compared to Khangai region, it is difficult to have cropping at Gobi region. OT company should try to improve local supply chain by local procurement of food and non-food items.
| Possibilities to increase population income | • Local people complain there is a lack of information at local level. Locals would like to know employment opportunities.  
• OT need to provide the list jobs, which they require, and locals should be trained accordingly.  
• Locals interested in finding out from the company which skills and trades the company needed at the mine sites, so that the soums could initiate training schemes to meet these needs.  
• Locals would like to work at mining with their family members. However, employment at mining require more labor, thus it is difficult women to be hired.  
• There are also hopes amongst the local communities that it will be possible to provide services and supplies to the mine camps, as a way of generating indirect employment.  
• These expectations range from ambitions to supply meat and milk (for instance building a new dairy farm), to herders directly selling meat and milk products and a hope that light industries will develop to serve the mine camps (including machinery repair etc.). |
|---|---|
### Field survey guidelines and themes

<table>
<thead>
<tr>
<th>Impact Objects</th>
<th>Additional information needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pasture</td>
<td>• Current level of dust generation and dust spreading nearby mine sites and along coal forwarding roads&lt;br&gt;• Pastureland take for construction and operation of OT project and building energy, road and water pipeline and its&lt;br&gt;• Land rights of local citizens: current, violations and potential consequences&lt;br&gt;• Local attitudes towards allocation of land and pasture to resettled people and immigrants</td>
</tr>
<tr>
<td>2. Potable and animal water</td>
<td>• Depletion of the underground water table: evidences and local perceptions&lt;br&gt;• Physical and chemical pollution and contamination of water&lt;br&gt;• Reduced well water yield&lt;br&gt;• Depth of newly made hand wells: changes and reasons</td>
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<tr>
<td>3. Agricultural productivity</td>
<td>• Local capacity to supply OT with products that meet OT standards and demands&lt;br&gt;• Cases that locally produced products and services mismatch the high OT hygienic requirements and preferences of consumers&lt;br&gt;• Poor quality and strong seasonality in crop production as a barrier to increased mine supply</td>
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<tr>
<td>4. Infrastructure</td>
<td>• Opportunities of remote settled people and users to access centralized infrastructures&lt;br&gt;• Expectation if the cost of maintenance and operation of infrastructures after mine closure</td>
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<tr>
<td>5. Banking</td>
<td>• Expected changes in banking service&lt;br&gt;• Increased savings</td>
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<tr>
<td>6. Resettlement and relocation vs. compensation</td>
<td>• Opportunities to rejoin herding after leaving mine jobs&lt;br&gt;• Internal movement and migration within soum and into areas of cumulative impacts&lt;br&gt;• Resettlement and burdens to the resettleds</td>
</tr>
<tr>
<td>7. Changes in social structure and systems</td>
<td>• Potential to raise conflicts between livers inside OT camp ОТ кэмп and local citizens: if so why&lt;br&gt;• Potential impacts and consequences of concentration of households and people in and nearby soum centres and OM camp&lt;br&gt;• Availability of jobs/employment and household income and changes in life cycle of employees (shifts, reduced care of family and family members, etc)</td>
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<tr>
<td>8. Local economic development</td>
<td>• Expectations of people to benefit from increased soum budget revenue&lt;br&gt;• Characteristics of market competition between local businesses and outsiders x&lt;br&gt;• Relationships between business expansion and extended tax base and OT project contributions</td>
</tr>
</tbody>
</table>
| 9. Mine closure and rehabilitation | • Impacts of slowdown in the local economic development as consequences of mine closure  
• Availability of financial and other sources to maintain infrastructures and communal service facilities after mine closure  
• Issues of dealing with increased unemployment after mine closure and possible options |
| 10. Safety | • How increased and dangerous trucks would impact safety of people, livestock and wildlife  
• Impacts and undesirable consequences of breaking laws and violating norms of social relations |
| 11. Community reactions | • Expected reactions and amenities of people if their expectations fail to come true |
| 12. Visual impacts | • How people perceive tailings and stockpiles and forms of reaction and disapproval  
• Impression and amenity reactions of the locals to destroyed land and vegetation clearings  
• Local perceptions/expectations if destroyed land and areas degraded by roads would be rehabilitated |
| 13. Air quality | • Impacts of dust-polluted on people’s life and health  
• Impacts of polluted air on elements of natural environment (soil, vegetation, water, pasture and wildlife) |
| 14. Noise | • Impacts of noise emissions on people’s life and health  
• Impacts of noises on basic elements of natural environment (soil, vegetation, water, pasture and wildlife) |
| 15. Vegetation cover | • Changes in characteristics of pasture: local ideas and perceptions and impacts of OT in particular |
| 16. Economy and livelihoods | • Mine contributions to local budget  
• Impacts on improved functioning of government service deliverers  
• Possibilities to supply locally produced goods (milk, meat dairy products) and services  
• Local capacity to accumulate sources from sells to mines to invest in local economy and  
• Prediction of increased population income |
| 17. Employment | • Opportunities for locals to be employed and receive skill development training  
• Gender issues of labor force participation  
• Impacts of importing labor from outside  
• Possibilities of indirect employment opportunities as positive impacts of mining |
| 18. Living conditions | • Impacts of improved availability of major services: energy, water supply, communication, Internet and transportation on local living conditions |
| 19. Population | • Changes in age categories  
• Changes in sex categories  
• Impacts on population settlement and concentration  
• Stability and communication within families and beyond (divorce, separation, co-inhabiting and reduced child care, etc) |
<table>
<thead>
<tr>
<th>Education</th>
<th>Cultural heritages</th>
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<tbody>
<tr>
<td>● Pressure on educational infrastructure</td>
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<tr>
<td>● More opportunities to obtain education</td>
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<tr>
<td>● Perceived impacts on school enrollment and participation</td>
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<tr>
<td>● Impacts on educational instruments and other course materials</td>
<td></td>
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<tr>
<td>● Social issues of 6 year old pupils</td>
<td></td>
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<tr>
<td>● Disturbance of tangible immovable heritage</td>
<td></td>
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<tr>
<td>● Disturbance on ritual and public ceremomical places</td>
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<tr>
<td>● Increased loss of paleonthological findings in community (in the hand of soum people)</td>
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<tr>
<td>● Modernity and loss of traditional culture of soum people</td>
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<tr>
<td>● Destruction of traditional knowledge systems</td>
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<tr>
<td>● Disturbance of potential tourist sites and attractions</td>
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