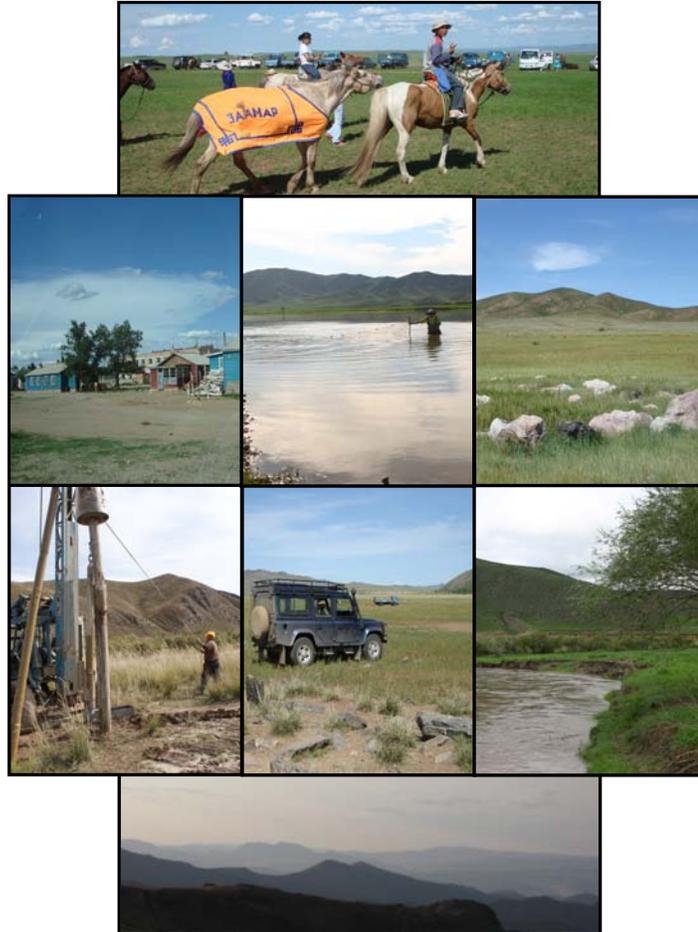


Social and Environmental Management and Monitoring Program

Big Bend Placer Gold Mining Project



Prepared for



WM Mining Company, LLC
Centennial, Colorado, USA

Prepared by



AATA INTERNATIONAL, INC.
Denver, Colorado, USA

October 2008

This set of documents outlines the plans that WM Mining Company, LLC (WMMC) intends to put into action for the Big Bend Placer Gold Mining Project in Mongolia. The documents consist of the Environmental Management and Monitoring Plan, Waste Management Plan, Cultural Resources Management Plan, Occupational Health and Safety Plan, Emergency Response Plan and Mine Reclamation and Closure Plan. The elements in these documents were based on the Social Environmental Impact Assessment for the Big Bend Placer Gold Mining Project (Project), which will undergo review and public comment.

The Public Consultation and Disclosure Plan outlines the manner in which WMMC may inform stakeholders about Project activities, potential impacts, and social and environmental management and monitoring measures. Stakeholders are encouraged to provide feedback, raise issues of concern, and identify opportunities for improvement.

The Community Development Plan: identifies the needs and priorities of local communities; provides mitigation measures information; identifies collaborative opportunities to leverage positive impacts; outlines specific activities and indicators; and fosters strategic, transparent community development.

The Environmental Management and Monitoring Plan contains the mitigation measures that WMMC plans to conduct during mining activities, as well as the environmental monitoring that will be established to detect/observe potential impacts during operations for which mitigation measures can then be developed and implemented.

The Cultural Resources Management Plan outlines the plan to identify, preserve and mitigate potential impacts of the Project to prehistoric and historic cultural resources in the Project area.

The Occupational Health and Safety Plan summarizes the health and safety procedures that will be implemented during the construction and operation of the Project.

The Emergency Response Plan contains the emergency plans, organizational responsibilities, reporting procedures, specific plans for responding to emergencies and emergency response training. This document also has general health and safety program components.

The Waste Management Plan outlines the Project commitment to taking all necessary steps to ensure that the collection, storage, transport and disposal of all wastes generated during all Project operations will be conducted in a safe, efficient and environmentally responsible manner.

The Mine Reclamation and Closure Plan is intended to return the mine area to functioning ecological communities.

These documents are those that need to be submitted before first disbursement of the financial agreement.

Public Consultation and Disclosure Plan (PCDP)

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1.0 Introduction

The Project Sponsor, WM Mining Company LLC, (WMMC) its Mongolian subsidiary, Ikh Tokhoirol LLC, are pursuing the development of a modern gold placer mining operation (the Big Bend Project) in the Tuul River mining area, north central Mongolia (see Figure 1). The progress of the Project, including reaching milestones such as the completion of an approved Mine Plan, a Mongolian Environmental Impact Assessment (MN-EIA), an International Social and Environmental Impact Assessment (I-ESIA), and an International Social and Environmental Monitoring and Management Plan (I-SEMMP) is summarized in Table 1. The MN-EIA was designed to meet the regulatory requirements of Mongolia and the SEIA and SEMMP were designed to meet the Performance Standards of the International Finance Corporation (IFC-PS, World Bank Group) and the internationally recognized Equator Principles.

This Public Consultation and Disclosure Plan (PCDP) and the SEIA/SEMMP provide information about the Project and its potential impacts, and the management of the project under international and Mongolian guidelines and regulations. These documents also detail past activities and future public consultation activities that are planned following the disclosure of the SEIA/SEMMP. There is no formal requirement for public hearings of MN-EIA under Mongolian Law, although public notices may be and are often given.

The consultation activities outlined here are designed to provide additional opportunities to Affected People and other stakeholders to provide feedback, raise issues of concern, and identify opportunities for improvement. This feedback provides important contributions to the design of the Project, the definition and implementation of its mitigation measures, and the Community Development Plan (CDP). Additional public disclosure, which may be initiated and chaired by the Ministry of Nature Environment, may be added to the activities outlined in this PCDP upon consideration by the government of Mongolia.

Table 1. Project Milestones

Date	Milestones
2002	Initial baseline investigations for initial EIA
2003	Original Zaamar EIA preparation
2004	Completion, posting, and OPIC approval of original Zaamar EIA
2008	Independent verification of proven and probable reserves completed
2008	Completion and approval of Mongolian Mine Plan
2008	Completion and submission of Mongolian General EIA to Ministry of Nature and Environment
2008	Completion and disclosure of the International SEIA

Figure 1 Location of the Big Bend Project



2.0 Project Synopsis

2.1 Project Description

The Big Bend Project is a relatively small gold placer deposit located in a governmental-designated mining district near Shijiir Alt, northeastern Mongolia. The operating plan is based on modern placer mining methods using cutter-suction dredge technology and modern IHC jigs to recover more gold than existing Russian technology. The Project will utilize modern placer mining methods to extract the placer ore body and associated overburden materials. The ore will be transferred to, and processed in, the floating processing mill, while waste rock will be directed to designated disposal areas.

The construction of the Project is expected to last approximately 6 months, followed by over 10 years of operation before initiating the mine closure. A more detailed project description is provided in the SEIA, including information on transportation of supplies, equipment, and hazardous materials such as fuels. Key

Project statistics are summarized in Table 2. The Local Area of Influence and transport corridor is depicted in Figure 2. The Local Area of Influence is detailed further in Figure 3. The communities and key social infrastructure located in the area are shown in Figure 4. The location of former and current land users within the Project and related land-contract boundaries are depicted in Figures 5 and 6, respectively.

Table 2. Key Project Statistics

Proven & probable reserve	Gold – 196750 ounces Value, US\$800/oz = \$157.4MM
Project design elements	Modern placer mining, cutter-suction dredge Floating processing plant with IHC jigs
Production data	Daily ore production 12000 tons Annual production <ul style="list-style-type: none"> • 16,200 ounces of gold
Mine life	Construction – 6 months Operations – 10+ years Followed by mine closure
Employment (Local, national, international)	Construction – 65 + Operations – 65 + (6 local, 6 expat, 53 natl)
Total Operating Costs	Life of Project – Labor US\$13MM Equipment Leasing – US\$2.2MM Fuel – US\$36MM Maintenance – US\$3MM General and Administrative – US\$6.7MM TOTAL – US\$60.9MM

Figure 2 The Local Area of Influence and Transport Corridor



Figure 3 The Local Area of Influence



Figure 4 Social Infrastructure in Local Area of Influence



Shijir Alt, Mongolia

Figure 5 Land Users within Big Bend Project



Local seasonal ger (herder family) with remnant exploratory mining at Big Bend site in the background

Figure 6 Land Users of Big Bend Project General Area



Individual ger West of Big Bend Project Area

2.2 Summary of Project Impacts

The planned transition of the Project from exploration to its pre/construction and operational stages brings with it a number of opportunities and challenges. The SEIA identifies potentially Affected Areas and People. The SEIA also describes the existing social context in Zaamar/Tuul River mining district. This includes the presence of recent opportunistic artisanal and small-scale mining (ASM) activities which have developed in the past 20 years in the wake of organized wet and dry placer mining. The illegal “ninja” miners moved in to rework tailings and deep deposits left behind in high walls and pits from the organized mining. Historically, since mining was started about 20 years ago, the region has witnessed waves of in/out-migration over the past 2 decades and exhibits limited social services and infrastructure. Mongolia was not a historical mining culture, as placers are prehistoric, and buried deep beyond surface access. The Mongolian government began to enforce laws to reduce “ninja” mining about 5 years ago, reducing significantly the amount of artisanal miners from over 5000 to less than 300 today (Zaamar Soum estimates).

Community health concerns include limited access to safe drinking water, gastrointestinal problems, and sexually transmitted diseases (STDs). Other issues of concerns are associated with limited or overstretched educational facilities, crime, social tensions, and high levels of local unemployment. The latter has improved over the recent past, largely due to the introduction of the Mongolian Government’s reduction of so-called “ninja” miners and artisanal mining in the area. All of these issues are already part of the local context and affect the livelihood and quality of life of local communities. A total of over 5000 ninja miners were reported to be active as recently as 6 years ago, with the current total of artisanal ninja miners in the Tuul River area now estimated at 300 or less.

The Project is expected to be associated with significant positive impacts. These include tax and royalty payments to the Mongolian government of well over US\$30 million over the project lifetime. Other Project benefits include vocational training, employment, procurement, and community development initiatives.

The SEIA also identified potential adverse impacts, which may be directly or indirectly associated with the Project. These include abrupt growth and subsequent contraction of employment and incomes associated with each of the distinct phases of the Project (construction, operation, and closure). Other potentially significant indirect Project impacts may be associated with any significant influx of migrants attracted by jobs and/or other perceived economic opportunities. The project has completed a social analysis report including detailed baseline definitions included in the SEIA.

A summary table, which lists potential social impacts and proposed mitigation measures, is presented in Appendix 1. Direct impacts may also include physical and/or economic resettlement of small groups of land-users located within or

accessing other areas through the Project boundaries (see Figure 6). This issue is described in more detail in the Resettlement Action Plan (RAP). A summary of the potential environmental impacts is shown in Appendix 3.

3.0 Regulatory framework

3.1 Mongolian Requirements

3.1.1 Public Hearing Requirements

The Government of Mongolia does not require that public hearings be held once final EIA documents are ready for evaluation, and the Ministry of Nature and Environment (MNE) sets the locations, timing, and protocol for any public disclosure. The modern international approach to free and open public hearings as part of EIS development does not exist in Mongolia. In keeping with international requirements, a modified public consultation and disclosure procedure is required.

3.1.2 Public Consultation for Projects

The concept of public consultation is not embodied in the Constitution of Mongolia and other national laws such as the Law on Environmental Impact Assessment. Frequently the SEIA only serves to inform the public and agencies of agency decisions, and is only procedural. Sometimes the public is informed, sometimes not. There is no formal public consultation procedure in Mongolia. However, the Big Bend Project has endeavored to engage the responsible parties at the Federal, Soum, and local levels, and has conducted a stakeholder engagement program on-site. Interviews with local herders and families were conducted and plans for continued public interaction are presented in this plan.

3.2 IFC/WBG and Equator Principles

The public consultation for the Project is designed in line with commonly accepted international standards. These are detailed further in Section 4 of the SEIA and include guidelines and standards of the International Finance Corporation (IFC, part of the World Bank Group) and those known as the 'Equator Principles' (EPs). IFC's April 2006 Policy and Performance Standards on Social and Environmental Sustainability (Performance Standards or PS) stipulate public consultation and disclosure requirements for 'A-level' projects (like the Big Bend Project).

The following IFC Performance Standards were considered particularly relevant in the context of developing this PCDP: PS1 on Social and Environmental Assessment and Management Systems; PS5 on Land Acquisition and Involuntary Resettlement; and PS7 concerning Indigenous Peoples. These require free, prior and informed consultation and informed participation and incorporation of

concerns of affected communities. This means that consultation should be “free” (free of external manipulation, interference or coercion, and intimidation), “prior” (timely disclosure of information) and “informed” (relevant, understandable and accessible information). These standards apply to the entire Project process and not to the early stages of the Project alone. The Sponsor is also expected to tailor its consultation process to the language preferences of the affected communities, their decision-making process, and the needs of disadvantaged or vulnerable groups.

4.0 Project Stakeholders

4.1 Introduction

The acquisition, exploration, and feasibility stages of the Big Bend Project have been ongoing for over a decade. During this period, the Sponsor was able to develop a good understanding and strong ties with local communities. The Sponsor’s recruitment from local communities of nearly half of its staff at the mine site during the exploration phase, its approach to local sourcing of supplies, and its on-going social investments have contributed to this process.

Over the years, the Sponsor has actively engaged local communities and other stakeholders throughout Mongolia in a variety of means including:

- Direct work with local communities to address their priority issues
- Project engagement and frequent meetings with stakeholders since acquisition of the project since October 2007
- Oral presentations and meetings
- Meetings with Soum Governors and representatives
- Meetings with Ministry of Nature and Environment
- Meetings with Ministry of Mining and Energy
- Dissemination of project information

The outcome of key consultation meetings are summarized further below (see Section 5). The knowledge gained from these and other meetings and relationships provided valuable insight into the existing social baseline conditions needed to define potential Project impacts. It also assisted in scoping the SEIA studies, identifying key issues of concern, developing the PCDP and RAP, formulating the CDP, and defining key stakeholders. These stakeholders are described below and include individuals, institutions, communities, and other groups who may experience direct positive or negative impacts from the Big Bend Project or those who otherwise have some interest in it. Stakeholders have been identified at the local, regional, national and international levels.

4.2 Local Area of Influence

The Local Area of Influence encompasses a relatively small area of the Big Bend, Tuul River, Mongolia. The **first zone** encompasses 5 individual small groups (families) of land users located within or requiring access through the Project boundaries. These are typical herders who move in and out of the area on a seasonal basis. In addition, an inventory of land owners and/or users located along the selected access roads to the mine site has been established by the Sponsor. Together, these groups may experience the most direct environmental and social impacts, including potential physical or economic displacement. These groups are described in further detail in the Resettlement Action Plan (RAP), annexed to the SEIA.

The **second zone** comprises the communities of Shijiir Alt (primary a community employed by Shijiir Al, a government-owned mining company) and Zaamar which are the closest structural communities nearest to the mining area. Aside from the land-users within the Project boundaries, the communities within the second zone are likely to experience the most immediate potential adverse direct and indirect Project impacts. These may include environmental impacts, increased traffic, in-migration, resource-use conflicts, and increased demand for infrastructure and social services. Correspondingly, communities located in the first and second zones are also defined as the primary beneficiaries of Project's Community Development Plan (CDP) and related initiatives. These communities have a combined population of approximately individuals.

The **third zone** includes communities farther away from the site, all the way to Ulaan Bataar, from where most of the labor and supplies will be sourced.

4.3 Local Communities

As detailed further in Section 6.0 of the SEIA and summarized below, the Local Area of Influence encompasses Zaamar and Shijiir Alt communities. The former is described below and the latter comprises communities developed largely in an unplanned fashion and as a result of artisanal and small-scale mining (ASM). The population of Zaamar Soum is estimated at 5841 (2007) and the population of Buregkhangai Soum is 2376 (2007). The population of the Shijiir Alt company mining town is estimated at 2000.

A picture showing informal artisanal miners panning for gold is shown in Figure 8.

4.4 Indigenous Communities

Mongolians are virtually 90%+ indigenous. Therefore, the analysis of indigenous peoples is not relevant in the normal context of the terminology. Nomadic herding is the principal indigenous lifestyle practiced throughout Mongolia, with

a large in-migration to Ulaan Bataar which holds more than 50% of the population of Mongolia.

4.5 Vulnerable Groups

The social and anthropological assessment identified five extended family groups of seasonal nomadic herders as potentially vulnerable due to their subsistence-oriented lifestyles, material dependency on natural resources (grazing agriculture), limited access to broader community safety nets, and potential for adverse Project impacts.

4.6 Local Government

The national and regional government and agencies receive taxes, royalties and payroll taxes from the Project. The Ministry of Mining and Energy and the Ministry of Nature and Environment are key stakeholders because of their role as regulators. Government-sponsored programs (and particularly the under the government sponsored mining projects nearby) are important drivers addressing the significant social challenges in the region outlined in Section 2 above.

Other key local government agencies include the municipality of Zaamar, the Zaamar and Buregkhangai Soums, the company mining town of Shijiir Alt, and other small communities. Various government agencies play important roles as providers of social services and infrastructure, as regulators, and/or because they define and monitor performance standards for the Project. The Sponsor has engaged with its governmental stakeholders during concession negotiation, exploration, feasibility, permitting and community development activities conducted over the past years.

4.7 Community Based and Civil Society Organizations

Civil society organizations are defined to include non-governmental organizations (NGOs), community-based organizations (CBOs), producer associations, cooperatives, business associations, religious groups, the media, trade unions, universities, and other research, educational and cultural institutions. These organizations operate on local, regional, national and international levels. They play relatively minor roles in the region but could further contribute to maximize the positive externalities and development impacts of the Project.

4.8 The Private Sector

A number of important private sector stakeholders were also identified. These include financial institutions and investors involved in financing the Project. Other mining companies operating in the area, such as Erel, Shijiir Alt, Monpolymet, KhosKhas, and others, are potential allies in dealing with common environmental and social challenges. Although their interests may not always be aligned, it may be possible to collaborate and take advantage of economies of

scale in supporting the artisanal mining sector; contingency planning and emergency response; disposal of wastes and hazardous wastes; and developing vocational training, supply chain and community development programs. The history of placer mining and deep, dry mining in the area has produced significant and long term environmental and social impacts.

The Big Bend Project is expected to create economic benefits related to new demands for goods and services. This will create opportunities for existing and new businesses to satisfy these demands. Thus, small- and medium-sized enterprises (SMEs) are also important stakeholders for the Big Bend Project. Other important, private-sector interests include those in the tourism sector. The Tuul River district can be further developed into an important staging ground for local, national and international tourists destined for Mongolian outback experiences. The current access road to the Project site is occasionally used as an access point for bird watching and steppe tour operators.

4.9 Bilateral and Multilateral Institutions

The scale and complexity of existing social challenges, including those associated with artisanal mining, institutional capacity building, community health, vocational training, and supply chain development, suggest that it would be beneficial to involve other stakeholders. It would be desirable to collaborate with bilateral and multilateral institutions and attract complementary expertise and financial resources in order to maximize the development impacts that can be generated by this Project.

5.0 Public Consultation and Disclosure

5.1 Introduction

The Project's public consultation and community liaison process can be described using the following phases and milestones:

1. Previous consultations and community involvement (1993 to present)
2. Public consultation and outreach for the SEIA process (2002 to date)
3. Public consultation and outreach following SEIA disclosure (post disclosure)
4. Community Development and Liaison during Project implementation

As described in Section 4 above and Appendix 2, the Project already features significant community and stakeholder engagement conducted following the acquisition, negotiation, exploration and feasibility stages. The Project Sponsor has been active in the Mongolian mining industry and in this area since March 1993. These efforts focused on understanding existing social conditions, identifying key issues of concern that contributed to the SEIA scoping process, and addressing immediate community needs leading to the development of the

key components of the CDP. The outcome of focus group meetings and interviews with on-site land-users is described in the RAP, annexed to SEIA. These discussions led to the evaluation of grazing pressure reduction strategies, biodiversity offset strategies, and mine planning, in association with transportation and community development planning.

The 2002-2004 surveys and rapid needs assessments were updated and expanded in mid-2008 and have been incorporated in Attachment 1, Appendix E of the SEIA. The 2008 activities included some 21 structured interviews with leaders from all sectors who are based in the Local Area of Influence. The on-site family herders were the focus of visits during the inspection conducted by the Overseas Private Investment Corporation (OPIC), August, 2008.

5.2 All-staff Meeting

Regular staff meetings are held in Ulaan Bataar and on-site. Meetings have included presentation of the preliminary SEIA results. Staff members were invited to comment on the presentation both during and after the meeting. Detailed dredge training for the Big Bend staff was conducted in the Netherlands, during Spring 2008. The questions raised by mine staff related to the following themes:

- Beginning of the Project (construction)
- Access, haul and transport roads and strategy
- Training Programs for the Big Bend personnel
- Occupational health and safety issues

5.3 Public Consultation Meetings

Following approval by, and in close consultation with, the Ministry of Nature and Environment, the potentially affected public and other interested stakeholders shall be notified about the Sponsor's planned public consultation meeting through direct invitations issued to community leaders, associations, and businesses through flyers distributed in key community locations (governor's houses, schools, community leaders) and through radio announcements. The meeting location(s) shall also be approved by the Ministry, but will likely involve Zaamar, Buregkhangai, and Shijiir Alt.

Given the scale of the anticipated public meetings, participants will be provided with forms in Mongolian language to enable the collection of written comments and questions and to provide an opportunity to evaluate the event in terms of format and information presented. The key issues raised during the public consultation meeting and results of the evaluation will be identified, sorted, and analyzed.

Key Project components and potential impacts will be presented. This will be followed by a question and answer period, which shall be continued more informally after that. The issues covered shall include a Project description and lifecycle, extensive baseline investigations and existing challenges, placer mining, dewatering, project infrastructure, flotation plant and gold, tailings management facilities, overburden and soil stockpile storage areas, transport of hazardous materials, employment and potential in-migration, protection of the Tuul River, and emerging environmental and social management plans. The supporting slides shall be presented in both Mongolian and Russian languages.

During past meetings, participants raised and/or submitted issues and questions. These are presented in Table 6, which also identifies the relevant SEIA sections in which these themes are discussed in detail. Most questions related to the starting date of the Project, followed by employment/training opportunities. Other issues or concerns raised related to community development plans (corporate social responsibility, indigenous people), artisanal/small-scale mining, environmental issues of concern, opportunities for micro-enterprises, and resettlement issues.

Project start-up is underway, with construction beginning in early 2009. With a policy of preferential hiring of local communities, the Project pursues an equal opportunity hiring policy. WMMC is seeking partnerships to create Small and Medium Enterprise (SME) linkages and supports programs to leverage local supply chain potential, recognizing all supplies and most labor will come from UB.

5.4 Social and Anthropological Assessment

The baseline data collection of 2002-2004 was updated and expanded in 2008, including detailed on-site interviews with local herders. The key issues of concern noted by interviewees are presented in Figure 10 below. The top concerns of those interviewed were: limited amount and limited quality of urban infrastructure and basic services, health, and education. Environmental contamination (particularly rivers, desertification) was also noted. Concerns about environmental degradation were included.

There exist positive expectations associated with the Big Bend Project. Positive project expectations relate to employment opportunities, followed by improvement of quality of life, major (positive) social and economic development impacts, and improvements in the educational sector.

There have been interview results relating to negative expectations associated with the Big Bend Project. Nearly one half of the interviewees expressed concern with expected environmental contamination. This is not surprising given the local experience base which is dominated by artisanal and small scale mining activities typically involving no environmental controls. However, other, larger scale

operations were also noted as reference cases associated with adverse environmental impacts. Other Project related issues of concern which have ranked highly included crimes (presumably connected to vandalism and in-migration), skill shortages and perceived lack of opportunities to work at the Big Bend operations. Concerns have also been raised about employment of skilled and unskilled local workers from Shijir Alt, and competition for qualified staff locally.

5.5 Meetings with Local Mongolian Herder Families

The Sponsor attended a gathering of Zaamar Soum at the local Naadam Festival, July 2008. This meeting provided an opportunity to present the Big Bend Project, share airag and cheese, and discuss issues of concerns.

The key themes which emerged during the meeting with the local Soum Governor were noted. The Governor requested meetings with owners of the project, and considered this meeting to be the first introductory meeting of the project. Referring to other mining examples, he noted adverse environmental impacts and similar concerns associated with the Big Bend Project.

5.6 Planned Disclosure and Consultations

The locations selected for the planned disclosure of the SEIA are detailed in Table 8 below. Given limited presence of local media, a project specific Big Bend Newsletter will also be utilized to respond to 'Frequently Asked Questions'.

Table 3. Planned Availability of Project SEIA/SEMMP

LOCATION	CONTACT DETAILS	DISCLOSURE
Ministry of Nature and Environment	Ulaan Bataar, Government Center,	International SEIA International SEMMP Executive Summary - Mongolian
Ministry of Mining and Energy	Ulaan Bataar, Government Center	International SEIA International SEMMP Executive Summary - Mongolian
US Embassy	Ulaan Bataar	International SEIA International SEMMP Executive Summary - Mongolian
Central Library, Ulaan Bataar	Central Library	International SEIA International SEMMP Executive Summary - Mongolian
Zaamar Soum	Governors House	International SEIA International SEMMP Executive Summary - Mongolian
ENVIRON	To be confirmed	International SEIA International SEMMP

LOCATION	CONTACT DETAILS	DISCLOSURE
		Executive Summary - Mongolian
Buregkhangai Soum Center	To be confirmed	International SEIA International SEMMP Executive Summary - Mongolian
WMMC Office	Ulaan Bataar	International SEIA International SEMMP Executive Summary - Mongolian
Website(s)/libraries of Sponsor and selected financial institutions participating in financing	OPIC, Washington, D.C.	International SEIA International SEMMP Executive Summary - Mongolian

Note: Disclosure locations still subject to project financing activities

In addition to the community engagement and public consultation meetings conducted to date, further consultation meetings are planned following the disclosure of the SEIA. In addition to one open public meeting more focused consultation meetings will be conducted and tailored to the needs of key stakeholder groups. These have been identified during interviews and anthropological assessments carried out in mid-2008. The meetings will be rolled out within 3-6 weeks following the disclosure of the SEIA. A non-exclusive list of planned meetings is listed in Table 9.

Table 4. Planned Consultation Meetings

STAKEHOLDERS*	APPROACH	COMMENTS
All stakeholders	Open Meetings	To be developed with MNE and MME
Community Councils, Public institutions,	Focus Groups	Zaamar, Shijiir Alt
	Focus Groups	Formal, informal leaders, trustees
Local Herders	Per their request (expected focus groups & community meetings)	Traditional Herders, Spring 2009
Land Users within Project Boundaries	Focus Groups	Part of RAP program
Other Groups	To be Determined	As needed
Private sector, small & medium enterprises	Focus Groups	Focus on supply chain
Religious organizations	Focus Groups	As may be arranged
Special interest groups (NGOs, academic community)	Focus Groups	As may be arranged
Trade Unions; cooperatives	Focus Groups	As may be arranged

The results of these meetings will be summarized in an addendum to the SEIA and considered for any required Project changes and refinements.

6.0 Feedback and Grievance Mechanism

The Sponsor's General Director is also charged with continuation of a Community Liaison function and developing a formal Grievance Mechanism. This mechanism is designed to help record, follow-up, resolve and report issues of concern or disagreements that may arise between stakeholders and the Project Sponsor and/or its contractors. The Community Liaison Team will be the main point of contact for any grievances. Grievances submitted verbally or in writing will be recorded and managed in a database. All grievances will be reviewed and followed-up by the Community Liaison Team, supported by other Project staff, the EPCM contractor, and consultants, as needed, with due regard to their urgency. Routine, internal reports to senior management will include key grievances, actions taken and outstanding issues. Periodic external reports, including the Annual Environmental and Social Monitoring Reports, will summarize grievances in an aggregate form, highlight actions taken, and list outstanding issues.

The primary contact for the PCDP is the General Director, who also manages the Community Liaison team of the Project. His contact details are as follows:

Mr. Wallace Mays, General Director
WMMC/Ikh Tokhoirol XXX
City Plaza 5th Floor, Seoul Street
Ulaanbaatar, Mongolia
Phone: (976-11) 322878
Fax: (976-11) 310200
Email: wmmi@aol.com

PCDP Appendix 1: Summary of Key Social Impacts and Mitigation Measures

ID	Activity/Action (Cause)	Potential Impact (Effect)	Proposed Mitigation Measures
SE1	Project infrastructure development and subsequent operational activities.	Physical and/or economic relocation of persons living, working or otherwise using the Project property and access roads (impacts on access and land use rights).	<ul style="list-style-type: none"> Analyze and implement prescriptive grazing program and control Develop and implement a Resettlement Action Plan (RAP) in line with World Bank standards, provide voluntary resettlement opportunities and improve the livelihoods of resettled individuals, open negotiated settlement Develop a Public Access Plan which: <ul style="list-style-type: none"> Discourages new in-migration (especially new access to the Cuyuní River) Employs surveillance (monitoring by guards) at key locations Checkpoints at main roadways leading to the Project property Regular patrolling of trails and right-of-ways Minimizing and decommissioning of roads, trails, and right-of-ways
SE2	Increased population with increased access to grazing and other natural resources. New and improved roads and trails and the power line right-of-way may increase access.	Increased pressure on natural resources. Anthropogenic impacts on steppe, wildlife, and aquatic resources.	<ul style="list-style-type: none"> Develop and communicate Employment and Contracting Policies and Procedures that discourage spontaneous migration through preference to local hires and regional recruitment centers Develop policies, procedures and training for employees and contractors related to grazing, clearing, hunting, fishing, fire, etc. Develop a Public Access Plan
SE3	In-migration (spontaneous) due to real and perceived increased economic opportunities.	Deterioration of already limited or ineffective basic infrastructure and social services.	<ul style="list-style-type: none"> Develop and communicate Employment and Contracting Policies and Procedures Work with affected communities and government agencies to develop a priority list of actions/investments Develop new partnerships, including with NGOs, to strengthen the institutional capacity of local government to provide social services and basic infrastructure Encourage additional government investments and co-finance infrastructure and social service projects identified as priorities by local communities through the Community Development Program
SE4	In-migration (planned and spontaneous) due to real and perceived increased economic opportunities.	Deterioration in already poor public health conditions, including a possible increase in the incidence and spread of infectious and sexually transmitted diseases.	<ul style="list-style-type: none"> Partner with organizations that can provide and/or improve effectiveness for community health workers, sex education workers and other preventive and integrated health education programming Collate (or develop/improve where needed) and monitor baseline health statistics in the Direct Local Area of Influence (including employees and contractors) Partner with organizations to improve more effective prevention and treatment programs for malaria, and monitor outcomes Encourage and co-finance investments in potable water and wastewater
SE5	In-migration (spontaneous) due to increased and perceived economic opportunities.	Existing baseline conditions indicate elevated levels of vandalism, alcoholism, prostitution, sexually transmitted disease, people trafficking, domestic violence, and illegal poaching, hunting. Depending upon its magnitude, potential spontaneous in-migration may add to these existing challenges.	<ul style="list-style-type: none"> Develop and communicate Employment and Contracting Policies and Procedures Develop policies, procedures and training for employees and contractors related to grazing, hunting, fire, etc. Develop new partnerships and promote alternative livelihood and Project-related and unrelated economic opportunities (including through the Community Development Program and leveraging ecotourism opportunities) Encourage local and regional institutional strengthening, especially human health
SE6	In-migration (spontaneous) due to real and perceived increased economic opportunities.	The local area is already characterized by unplanned settlement (Shijir Alt) and growth and invasion of open spaces. A large-scale influx of additional migrants could further contribute to these problems as well.	<ul style="list-style-type: none"> Develop and communicate Employment and Contracting Policies and Procedures Develop new partnerships with NGOs and others to strengthen the institutional capacity of local governments in the areas of urban planning, housing, zoning, cadastre and finance Encourage additional official investments to support planned urban development.
SE7	Impact on culture and identify communities.	Local Mongolian people are already broadly integrated into the social environment, though they live in separate areas and maintain traditional nomadic and social codes. It is unlikely that they will experience any significant loss of traditional cultures, customs and languages.	<ul style="list-style-type: none"> Promote Mongolian language and cultural education in schools Select Community Liaison and other staff with Mongolian language skills Provide community outreach, monitoring report summaries, public consultation and other materials in Mongolian language
SE8	Increased tensions from perceived preferential employment and procurement policies and CDP, access/control over land and other natural resources, presence of non-local workforce, and government removal of artisanal miners.	Increase of existing ethnic, cultural, and social tensions and conflicts between and among groups, recent migrants, labor unions, and the Project workforce. Cultural clash and economic disparities between non-local workforce and residents.	<ul style="list-style-type: none"> Implement a 'closed camp' policy that minimizes conflicts between the 'imported workforce' and local residents Ensure participatory development implementation of CDP and report on outcome Collaborate with government to develop and implement technical assistance program for artisanal miners; Provide voluntary exit opportunities for artisanal miners through vocational training, employment and supply chain opportunities
SE9	Time/task limited employment and associated planned layoffs at the end of the construction phase, and after end of operation.	Pre-existing conditions include high level of unemployment, Additional cycles of employment and unemployment, and economic growth and contraction may be associated with different stages if Project life cycle.	<ul style="list-style-type: none"> Provide training opportunities to local people to improve their employability and transition to other projects and/or sectors Support the establishment of local financial services (potentially including NGO intermediaries) to promote personal savings and allow employees to bridge employment and income gaps Support the development of micro-enterprise and alternative income generating activities Create a "job bank" in cooperation with other employers in the region Develop a consistent message "Project jobs are not work for life" Give preference to local outsourcing, including small-scale suppliers Develop partnerships and provide technical assistance to accelerate scale-up of local supply chain
SE10	Visual and aesthetic impacts associated with excavation, noisy operations, light pollution, the tailings ponds, and other facilities which will be visible from other areas	Deterioration in landscape quality with possible economic, environmental and sociocultural repercussions.	<ul style="list-style-type: none"> Limit project footprint, height of facilities, and visual impacts as feasible Develop a Decommissioning and Restoration Plan which blends mine site into its surrounding Expand wetland, riparian, and open water habitats according to reclamation plan Decrease grazing pressure to increase biodiversity and productivity of uplands

PCDP Appendix 2: Summary of Potential Environmental Impacts

Environmental Parameter	Potential Gross Impacts	Mitigation Measures	Potential Net Impacts
Topography and Landscape	Excavation of overburden, placer mining area. Disposal of overburden and tailings. New landforms created (small hills). A new fresh water lake. Construction of new roads and field camps. Disposal of solid waste.	Reclamation of disturbed areas, including re-contouring of sediment ponds, diversion ditches, waste rock deposition areas and tailings management facility. Re-vegetation to stabilize new landforms. Utilize existing roads. Construction of a solid waste landfill.	Long-term changes in topography and landforms; and a new lake.
Air Quality	Fugitive dust from roads, waste rock sites, tailings management facility, stockpiles, and other disturbed areas. Emissions from mobile sources, processing; and VOCs from fuel storage. Exhaust emissions from mobile equipment.	Implement fugitive dust control (water spraying, etc.) as needed. Implement concurrent reclamation during construction and mining. Routine maintenance of equipment. Use of solar and wind power.	Short-term: slight increases in dust. Long-term: no significant impacts. No significant net impact from gaseous emissions.
Surface Water	Increased sedimentation potential to Tuul River. Potential contamination by diesel fuel, oil, or surface runoff. Contamination with improperly treated sewage. Creation of breeding areas for vectors such as mosquitoes.	Erosion and sediment controls (sediment ponds, silt fencing, geotextiles, levees, etc.). Secondary containment of all fuel storage facilities Operation's sewage septic system routinely monitored and pumped. Reclamation plan to ensure proper drainage. Operator will routinely monitor vectors and implement an integrated vector control program.	Short-term: slight increase in sedimentation possible, but not significant; reduction in vector-borne diseases. No other significant impacts.

PCDP Appendix 3: Summary of Potential Environmental Impacts
(continued)

Environmental Parameter	Potential Gross Impacts	Mitigation Measures	Potential Net Impacts
Groundwater	Groundwater utilization. Potential contamination from fuel/lubricant spills and sewage.	Monitor cone of depression from groundwater wells. Fuel storage areas have secondary containment and lined bottom to protect groundwater. SPCC program. Operation's sewage septic system routinely monitored and pumped to meet discharge standards. Reduction of infiltration and seepage from tailing and waste rock deposition area and other measures that may be necessary to reduce and control acid seepage.	Insignificant.
Soils	Large areas/volumes of soils (overburden) removed from mining area, sediment ponds, roads, operational sites; and deposited in top soil stockpiles. Potential for wind and water erosion.	Strip topsoil and stockpile; erosion and sediment control plan. Concurrent, continuous reclamation of all disturbed sites beginning with construction and carrying through operations.	Short-term: significant direct impact from soil displacement. Long-term: no significant impact due to restoration. Improvement due to biodiversity offsets, reduced grazing.
Vegetation	Direct vegetation removal from road ways, power line corridors, pit and mining areas, tailings management facility, camp, facilities, and other operational areas.	Re-vegetation of disturbed areas. Use of native plants for re-vegetation. On-site nursery program and restriction of grazing.	Short-term: significant impact to vegetation from removal or conversion to altered habitat. Long-term: improvement
Wildlife	Removal of some habitat; displacement and destruction of some species of terrestrial wildlife. Localized disturbance from noise. Introduction of exotic or invasive species deemed very low.	Reclamation and re-vegetation of disturbed habitats. Some area may have to be designated as wildlife refuges to protect fauna. Maintaining corridors for movement in the Project area. Policies to control exotics. Biodiveristy offset plan.	Short-term: possible reduction in some terrestrial wildlife populations in areas of disturbance. Long-term: no significant impacts. Potential positive impact from establishment of eco preserve.

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PCDP Appendix 3: Summary of Potential Environmental Impacts
(continued)

Environmental Parameter	Potential Gross Impacts	Mitigation Measures	Potential Net Impacts
Aquatic Ecology	Indirect impacts of increased sediment on aquatic ecosystems. Loss of some habitat	Erosion and sediment control program to eliminate or minimize sediment inputs to local creeks and Tuul River. Biodiversity Offset Program.	No significant impact. Potential positive impact for aquatic species from research and habitat enhancement, sediment controls.
Ecologically Sensitive Areas	Riparian zones, wetlands, and open water are high quality habitats. Upland habitats impacted currently by grazing.	Reclamation of disturbed areas, reduction and control of grazing impacts. Creation of riparian, wetland, and open water habitats.	No long-term impacts anticipated. Potential long-term positive effect from establishment of ecological preserve.
Archaeological Resources	Total of 13 sites documented.	Avoidance and detailed arch mgmt plan.	No long term impacts anticipated.
Social Conditions	Economic and or physical displacement of small numbers of land users within the project boundaries (5 seasonal herders). Spontaneous in-migration and associated burden on limited social infrastructure. Further increased social tension (artisanal mining related). Increased employment and procurement opportunities, and subsequent contraction after ending construction and operational periods. Visual and aesthetic impacts. Vandalism, prostitution, STDs, people trafficking, and other social impacts from increased numbers of workers. Competition for jobs.	Introduced significant project design changes to minimize necessity for future resettlement. Project benefits and assistance described in Resettlement Action Plan (RAP). Social investment program, vocational training, and preference for local hires detailed in Community Development Plan (CDP). New partnerships, collaboration & institutional capacity building for social services/infrastructure, including for communicable diseases (STDs). Semi-closed camp policy. Limit footprint, height, lighting as feasible. Community Liaison and Grievance Mechanism to promptly address issues of concern. Technical assistance to reduce environmental and social impacts from artisanal miners. Encourage official investments to support planned urban development.	Improved livelihood of historically resettled groups. Increased job availability (limited to construction and operation phases). Significant tax revenues and additional social investments. Reduction of existing impacts of artisanal mining and associated social tensions. Improved institutional capacity. Residual visual & aesthetic impacts.

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PCDP Appendix 3: Summary of Potential Environmental Impacts
(continued)

Environmental Parameter	Potential Gross Impacts	Mitigation Measures	Potential Net Impacts
Social Conditions - related to environmental issues	<p>A small reduction in high quality lowlands, wetlands, riparian, and open water habitats, upland habitats impacted by grazing.</p> <p>Risks associated with transport of hazardous materials.</p>	<p>Concurrent, continuous reclamation and re-vegetation of disturbed habitats from construction through mining. Selected re-vegetation and decreased grazing pressure.</p> <p>Discouragement of (existing) invasion of open spaces.</p> <p>New groundwater well installed already.</p> <p>Sponsor to develop emergency response capability.</p>	<p>Short-term: no significant impact as reduction is small in magnitude. Increased valuable habitats, biodiversity from open water, wetland, upland, and riparian increases.</p>
Cumulative Impacts	<p>Increased traffic, dust, noise, air pollution, water pollution, and stress to local infrastructure. Loss of some flora and faunal habitat. Water pollution from erosion and sediment transport to Tuul River.</p>	<p>Social program designed to support local infrastructure, education, etc. Seeking opportunities for partnership with stakeholders, including other mining companies and the MN government. Communication and cooperation regarding shared resources and other mining companies.</p> <p>Modern mining and Reclamation Plan, SEMMP as example to others.</p>	<p>Positive impact: identification and control of adverse cumulative impacts. Serving as model to Mongolian mining industry a positive step toward reduction in social and environmental impacts.</p>

Community Development Plan (CDP)

Social and Environmental
Management and Monitoring Program

Big Bend Placer Gold Mining Project



Prepared for



WM Mining Company, LLC
Centennial, Colorado, USA

Prepared by



AATA INTERNATIONAL, INC.
Denver, Colorado, USA

October 2008

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1.0 Introduction

1.1 Project Background

The Project Sponsor, WM Mining Company LLC, (WMMC) its Mongolian subsidiary, Ikh Tokhoirol LLC, are pursuing the development of a modern gold placer mining operation (the Big Bend Project) in the Tuul River mining area, north central Mongolia (see Figure 1). The progress of the Project, including reaching milestones such as the completion of an approved Mine Plan, a Mongolian Environmental and Social Impact Assessment (MN-EIA), an International Social and Environmental Impact Assessment (I-ESIA), and a Social and Environmental Monitoring and Management Plan (I-SEMMP) is summarized in Table 1. The SEIA and SEMMP were designed to meet the regulatory requirements of Mongolia as well as the Performance Standards of the International Finance Corporation (IFC-PS, World Bank Group) and the internationally recognized Equator Principles.

The planned transition of the Project from exploration to its construction and operational stages brings with it a number of opportunities and challenges. The SEIA includes a social baseline study. It identifies key stakeholders, describes existing challenges, and identifies needs and expectations of the local communities. The key challenges include the historic in-migration of small-scale artisanal miners over the past two decades as organized mining opened up deep placer deposits. Historically, Mongolian culture was based upon nomadic herding, which continues today. Placer mining was not part of the Mongolian culture until organized mining started to uncover deep placers about 20 years ago. The so-called “ninja” mining community, artisanal in nature, has only developed recently since organized placer mining started, providing access to tailings, and deeper deposits left from drag lines and placer mining dredges.

There exists limited social services and infrastructure in the Tuul River mining area. Community concerns relate to access to drinking water, crime, high levels of sexually transmitted diseases (STDs), alcoholism, prostitution, human trafficking, vandalism and related problems. Other issues of concerns are associated with limited or overstretched educational facilities and local unemployment. All of these issues are already adversely impacting the quality of life of local communities, including the company town of Shijiir Alt, Zaamar, and Buregkhangai, as well as other localities.

The SEIA also identified potential adverse impacts that may be associated with the Project. These are summarized in Section 3 and tabulated along with mitigation measures in Appendix 1 of this report. The Project is also expected to be associated with major, direct, positive impacts, such as tax and royalty payments of well over US \$30 million over the Project lifetime; training,

employment and procurement opportunities; and significant investments in community development initiatives detailed further below.

Figure 1 Location of the Big Bend Project



Figure 2 Local Area of Influence and Social Infrastructure



1.2 Objectives of the Community Development Plan (CDP)

This Community Development Plan has five key objectives:

1. Identify the needs and priorities of local communities
2. Provide mitigation of adverse Project impacts
3. Identify collaboration opportunities to leverage positive impacts
4. Outline specific activities and indicators
5. Create strategic and transparent community development plans

1.3 Methodology

The exploration and feasibility stages of the Project have been ongoing in some form (under previous ownership) for more than a decade. Since March, 1993, the Sponsor has actively engaged with and supported local communities and other stakeholders through a variety of means in Mongolia. These have included:

- Surveys, interviews, and assessments
- Presentations and public consultation meetings
- Direct work with local communities to address priority issues
- A variety of on-going social programs
- Humanitarian aid and sponsorships
- Educational and cultural support to Mongolia

More specifically, Mr. Wallace Mays, General Director, through his personal and corporate activities with WM Mining has performed and/or provided the following:

- Desalination system to provide good quality drinking water to Matad Sud
- Developed a 10 ha irrigated vegetable farm in Selenge Aimag
- Transportation and housing (hotel rooms) to bring 28 medical professionals from Los Angeles, CA, USA to women's and children's hospitals in Ulaanbataar
- Brought Mongolian mining professionals for training in Denver to study English
- Sponsored several Mongolian students for college education in USA
- Text books for school children studying in USA
- Supported several small enterprises, such as cashmere and tourist camp
- Trained 8 Mongolians in the Netherlands on dredge operations and maintenance
- Supported management of the Mongolian town of Mardai

A summary and outcome of these activities is presented in the Public Consultation and Disclosure Plan (PCDP), which forms part of the SEIA. These activities facilitated the identification of key issues of concern of these communities, assisted in estimating the potential adverse Project impacts, and pointed to intervention opportunities to develop Project ‘up-sides.’ The CDP will be subject to further public consultation and discussion with stakeholders following the disclosure of the SEIA report. The resulting CDP (Version 3.0) will also be subject to annual monitoring, fine-tuning and reporting. This will help to disseminate outcomes, incorporate lessons learned, respond to changing needs, and match activities with priorities, available resources and access to strategic alliances.

1.4 Structure of Report

Following the Introduction in Section 1, the regulatory and policy context is presented in Section 2. Key findings of the SEIA are summarized in Section 3. Section 4 describes emerging intervention opportunities. Section 5 contains an outline of on-going and proposed programs and initiatives. Section 6 outlines financial commitments and monitoring requirements.

1.5 Contact Details

The primary contact for the CDP is the General Director, who also manages the Community Liaison team of the Project. His contact details are as follows:

WM Mining Company LLC
Ikh Tokhoirol XXK
City Plaza, 5th Floor, Seoul Street
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2.0 Relevant Policies and Guidelines

2.1 Mongolian Community Development Programs

The Government of Mongolia aims to facilitate a more balanced economic development throughout the country as it transitions to a market economy of democratic nature. Particularly relevant to the Project, the government of Mongolia has identified key elements to cope with the movement of people from the rural areas and communities to the central capital city of Ulaan Bataar, which now contains about 30% of the population of the entire country. Maintenance of the nomadic rural herding lifestyle is an issue. Five key strategies have been identified relating directly to the Project area, are noted below:

1. Improve inter-institutional coordination, effectiveness and coverage of public services in the region
2. Promote planned, efficient and sustainable mining activities, including introduction of lower-impact technologies, with improved reclamation and sediment controls
3. Promote a more efficient and conservation-oriented use of steppe resources and incorporate rural populations
4. Strengthen cooperatives and community associations to develop small enterprises, improve agricultural sectors, and to generate jobs
5. Promote and develop the ecotourism sector

2.2 WBG Policies and Guidelines

The World Bank Group's World Development Report of 2000/2001: "Attacking Poverty"¹ highlighted that moving people out of poverty requires multi-dimensional interventions. Numerous assets and capabilities are required at both the individual and group levels to lift people out of poverty and improve the quality of their lives. These include health, education, housing, organization, access to opportunity, security, and empowerment for economic growth. The World Bank Group's (WBG) response strategy to support its client governments is twofold. First, it supports initiatives aimed at developing a suitable climate for investment, jobs, and growth. Second, it supports activities aimed at empowering poor people and developing their assets.

The International Finance Corporation (IFC), which is the private sector oriented arm of the WBG, promotes sustainable private sector development, which can

¹ See also

<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTPOVERTY/0,,contentMDK:20194762~pagePK:148956~piPK:216618~theSitePK:336992,00.html>

contribute towards poverty reduction and improve peoples' lives. Responding to internal and external reviews of its extractive industry sector operations, the WBG aims at "Striking a Better Balance"² by promoting the application of the following principles:

- Strengthen governance, transparency and monitoring
- Revise its environmental and social policies and standards
- Strengthen public consultation
- Ensure best-practice approach in the area of biodiversity
- Strengthen local economic linkages and supply chains

2.3 Industry Principles

The London-based industry association International Council on Mining & Metals (ICMM) developed a set of Principles for its corporate membership, which provides a useful reference for the Project. Specifically, Principle 9 notes the need to "Contribute to the social, economic and institutional development of the communities in which [the mining and metals industry] operate[s]." This Principle is detailed further as quoted below:

- *Engage at the earliest practical stage with likely affected parties to discuss and respond to issues and conflicts concerning the management of social impacts*
- *Ensure that appropriate systems are in place for ongoing interaction with affected parties, making sure that minorities and other marginalized groups have equitable and culturally appropriate means of engagement*
- *Contribute to community development from project development through closure in collaboration with host communities and their representatives*
- *Encourage partnerships with governments and non-governmental organizations to ensure that programs (such as community health, education, local business development) are well designed and effectively delivered*
- *Enhance social and economic development by seeking opportunities to address poverty*

2.4 Sponsor's Corporate Values

The Sponsor is committed to the following corporate values:

² Striking a Better Balance – The World Bank Group and Extractive Industries: The Final Report of the Extractive Industry Review of the World Bank Group, Management Response, Sept 17, 2004 (<http://siteresources.worldbank.org/INTOGMC/Resources/finaleirmanagementresponse.pdf>)

We understand the actions and conduct of every WMMC Big Bend employee and contractor are the basis on which our stakeholders will evaluate our commitment to achieving the highest standards of social responsibility. WMMC is committed to achieving and maintaining standards that are comparable with best mining practices. The Company's social responsibility commitment is supported by the following principles:

- *Give back to the communities where we operate by providing local employment and purchasing initiatives*
- *Sustain meaningful community development initiatives and support local not-for-profit projects*
- *Train our people and provide the resources to meet our social responsibility objectives and targets*
- *Respect the social, economic and cultural rights of indigenous people*
- *Wherever appropriate and feasible, set operating standards that exceed the requirements of the local law*
- *Assess and compare our actual performance versus our policies and standards*
- *Demand leadership in social responsibility from all of our people*
- *Seek to share our success by partnering with stakeholders in appropriate community development programs*
- *Consult stakeholders in matters that affect them*
- *Strive to communicate our performance in an accurate, transparent and timely manner*

2.5 Mining Concession Requirements

The Sponsor has agreed to specific community development obligations, which form part of its mining concessions, titles and land contracts for the Big Bend Project. These commitments include the following elements:

- Contribute to local health clinics and modern medical training
- Support mining-oriented academic institutions and student internships
- Collaborate with government specified social organizations
- Apply preferential local hiring and initiate related training programs
- Support local schools
- Improve watershed management, protect fisheries, reduce sediment, and support Siberian Taimen programs in the Tuul River
- Establish broad educational support for improved range management

These commitments and status of their implementation is detailed in Appendix 2.

3.0 Social Baseline and SEIA Findings

3.1 Summary of Results

This chapter summarizes the outcomes of the social baseline studies and public consultation activities conducted in 2008. These are detailed further in Section 6 of the SEIA and the PCDP. They also incorporate the results of impact assessments conducted previously and posted for public comment (2004).

A summary table, which lists potential Project-related social impacts and proposed mitigation measures, is presented in Appendix 1 of this report. Direct impacts include limited resettlement of small groups of land-users within the Project boundaries. Additional resettlement was avoided by adopting suitable Project alternatives. This aspect is described in more detail in the Resettlement Action Plan (RAP).

Abrupt growth and contraction of employment and income associated with the distinct lifecycle stages of the Project (construction, operation, and closure) may have significant undesirable local economic impacts. Other potential impacts are largely indirect or secondary in nature, and match the existing experience of artisanal mining related activities and baseline conditions of a 'frontier mining area'. Baseline conditions are characterized by the following:

- Unplanned settlement (including desertification, grazing, and invasion of open spaces,)
- Limited or ineffective social infrastructure and services (schools, medical facilities, access to water)
- Significant unemployment (estimated at 25%+)
- Community health concerns (STDs, gastrointestinal disease)
- Crime and security concerns, vandalism, human trafficking
- Social tensions between mining and rural inhabitants

The most significant (indirect) Project impacts may be associated with potential spontaneous and large-scale influx of migrants in search of jobs and/or other perceived economic opportunities. Although not a new phenomenon in a region which continues to experience periodic gold rushes from time to time, such an influx may add an additional burden to the already challenging baseline conditions. Recent efforts over the past 5 years to reduce ninja mining were successful, but ninja mining continues in certain areas.

Interviews and opinions collected largely confirmed the expert assessments and provided an additional valuable source of information.

Specifically, the key issue of current concern in the area noted by interviewees during 2008 studies included the following: limited amount of employment, and limited quality of urban infrastructure and basic services, health, and education. Environmental contamination (particularly rivers, sediment from mining project erosion) was also noted. Concerns about environmental degradation were rated consistently much higher by interviewees from rural communities. Concerns about unemployment were prevalent, presumably due to lack of government work programs and an apparent harsh control of illegal mining, now regulated by Central and Soum governments in the region. Vulnerable groups also identified need for additional and improved housing, food distribution, and safe water supplies.

Positive Project expectations relate to employment opportunities, followed by improvement of quality of life, major (positive) social and economic development impacts including roads and bridges, and improvements in the educational sector.

When asked about negative Project expectations associated with the Big Bend Project, nearly one half of the interviewees expressed concern about expected environmental contamination. This is not surprising given the local experience base which is dominated by governmental, artisanal and small scale mining activities typically involving no environmental controls. However, other, larger scale operations were also noted as reference cases associated with adverse environmental impacts. Interviewees rated environmental concerns quite high. Other Project related issues of concern which ranked highly included serious crimes (presumably connected to in-migration), skill shortages and perceived lack of opportunities to work at the Big Bend operations. Concerns over the availability of high quality grazing land were voiced, but the level of range management knowledge of onsite herdsman was very low, and much education will be required to bring the herding into balance with the local steppe productivity.

The knowledge gained from the above noted interviews and consultation meetings provided valuable input to define the social baseline conditions and existing challenges. It also assisted in scoping the SEIA studies, developing the PCDP and the RAP, and formulating the Community Development Plan.

3.2 Key Stakeholders and Target Communities

For the purpose of the CDP, the primary stakeholders and target communities are defined to include individuals, institutions, and communities (rural, mining, governmental, or otherwise) located in the Local Area of Influence. This area is depicted in Figure 2 and can be subdivided in three zones. The **first zone** encompasses small groups of land users located within, or requiring access

through, the project boundaries. These groups are described in further detail in the Resettlement Action Plan (RAP), annexed to the SEIA. The **second zone** comprises communities of Shijiir Alt and Zaamar. The **third zone** includes communities farther from the site, including along the road to Ulaanbataar and the town of Buregkhangai.

Land-users within the first and second zones of the Local Area of Influence are likely to experience the most immediate potential adverse direct and indirect Project impacts. These communities have a combined population of approximately 5000 individuals. These communities are also the primary target of the CDP (e.g. Shijiir Alt and Zaamar).

In addition, a group of stakeholders have been identified which can play an important role in facilitating, leveraging and delivering positive environmental, social, and economic impacts in the wider Project area. These stakeholders include other mining companies in the region, government agencies, bilateral and multilateral institutions, and Mongolian and international civil society groups. A non-exhaustive listing of stakeholders is presented in Table 1. This table will be updated following additional public consultation and search for strategic alliance partners.

Table 1 Stakeholders Who Can Facilitate, Leverage And Deliver Positive Impacts

Potential Stakeholder	Potential Role	Comments
Local communities, including local ger settlements, the latter including Shijiir Alt, a mining company town, owned by the Mongolian Government	Could be impacted positively and negatively by the Project; can provide employees, contractors, and supplies	Local communities largely integrated in socio-economic environment; in-migrated artisanal miners often live in areas with unplanned urbanization
Government agencies: Municipality of Zaamar and , Ministry of Nature and Environment, and Ministry of Mining and Energy	Local governments provide social infrastructure and services; government agencies regulate and monitor Project; they are critical alliance partners for community health, educational, small-scale mining, economic diversification and other community development initiatives	The Mongolian Government will receive upwards of US \$30 million in taxes and royalties during mine life
Other larger mining operations, including Erel, Monpolymet, Shijiir Alt, KhosKhas, et al.	Joint solutions for required infrastructure (landfills, hazardous waste), emergency preparedness and response (hazardous goods transport, natural disasters), social infrastructure (health, education, training, roads).	Joint solutions and shared costs can reduce the cost to each individual organization; introduce economies of scale and diversifying funding resources. Coordination may be challenging.
Non-governmental, faith-based, community-based, and academic organizations	Contribute critical local expertise, credibility, capacity building, and additional resources for biodiversity, community health, education, small-scale mining, and economic diversification.	May require seed funds and co-financing to attract their services and expertise to Project region; may also require support to mobilize international best practice, expertise and resources
Small and Medium Enterprises (SMEs) and entrepreneurial stakeholders, including suppliers, contractors, producer associations, cooperatives, tourism sector, and trade unions	Critical alliance partners for local supply chain development, economic diversification, small-scale mining initiatives, and vocational and business management capacity building	The involvement of these groups can help maximize local economic multiplier effect and promote know-how transfer
Illegal ninja miners, remnant populations of government controlled illegal miners	Working with other alliance partners, Project could provide technical support to improve prospecting certainty and reduce adverse environmental/social impacts	Informal but important livelihood provider with adverse externalities, management of artisanal & illegal mining is a challenge in all areas of the world
At risk youth (including in the artisanal mining communities)	Project supports cultural and sports initiatives utilized by large number of youth, and special training for young locals	Communities concerned about drugs, early teen pregnancy, STDs, etc. requested and received Project intervention
Tourism sector	Further develop the world-class tourism potential of the region; contribute to economic diversification	Tuul River is on route to remote steppe tourism. Poor local infrastructure is barrier to capturing additional income streams
Media	Collecting, analyzing and disseminating information and opinions about the Project	Media largely in Mongolian language, but language does not limit access, need Russian and English info

¹Government social programs administered directly by the Executive Branch

3.3 Intervention Opportunities

Based on the experience of the Sponsor and supported by the result of the I-SEIA and public consultation, the following areas of intervention emerged as key priorities:

- Watershed protection, erosion control, and sediment control
- Education
- Community health and youth programs
- Employment and professional training
- Economic and SME-linkage opportunities
- Working with Government regarding illegal nija mining
- Nature (biodiversity) conservation offsets
- Institutional capacity building

Vulnerable groups identified housing improvement as one of their priority needs. Further more, the leadership of the Zaamar Soum also identified land deterioration and degradation of riparian habitats as one of their key priorities.

Interventions in the above areas, which are detailed further in Sections 4 and 5, can:

- Mitigate potential adverse Project impacts
- Contribute to the improvement of quality of life of local communities
- Provide an enabling environment to capture Project related and unrelated economic development opportunities
- Further empower and strengthen government agencies to pursue their roles and responsibilities

4.0 Improving Quality Of Life and Conservation

4.1 Selection of Opportunities

Section 3 above identified key issues of concern and related generic intervention opportunities. These are detailed further below. The nature and magnitude of associated challenges, most of which were present prior to the development of the Project, require synergetic and cross-sectoral interventions to further increase the scale of positive outcomes. An initial list of selection criteria for Project-supported interventions is presented below. Selected projects should be designed and implemented to:

- Mitigate direct and indirect Project impacts
- Meet local community and other stakeholder needs
- Improve quality of life of target communities
- Enable economic development and diversification
- Enable financial leverage, strategic alliances and learning
- Complement the Mongolian economic and social objectives
- Reduce and eliminate Project dependency over time (exit strategy)
- Meet Ikh Tokhoirol XXX corporate values and social obligations

As part of the Project's public consultation efforts, the Sponsor will conduct a search for cross-sectoral partnerships, and establish and/or support several long-term strategic initiatives to further improve the effectiveness and reach of existing and planned new interventions. In addition to local community organizations, these partnerships may also include other mining companies, government agencies, NGOs/foundations, academic institutions, and bilateral/multilateral organizations. The Sponsor will continue to consider logistical support for external medical assistance to the region when these can help meet the objectives of the CDP. The Sponsor is also interested to become a co-sponsor of initiatives aimed at fighting alcoholism, malnutrition, and STDs (including HIV/AIDS), which could benefit a community of nearly 5000 individuals.

4.2 Water and Sanitation

Generally, the communities in the vicinity of the Project have access to good quality groundwater. However, water is generally untreated and ease of access, quality, and reliability are variable. Surface water quality of the Tuul River has deteriorated, especially due to poor watershed management, mining and grazing disturbance, and lack of effective erosion controls. Poor water quality, probably combined with hygiene issues, is believed to contribute to some gastrointestinal diseases.

During the summer of 2008, the Sponsor conducted a rapid survey of Zaamar and Shijir Alt water supplies. The objective of this survey was to establish water infrastructure needs of these communities.

Additional water quality sampling and field screening analysis may need to be carried out to help further prioritize future intervention needs. Complementary training in preventive maintenance, as well as sanitation and hygiene, may also be required to achieve the desired effect of reducing gastrointestinal diseases. This would ensure that inappropriate handling, storage and disposal of wastewater and other practices do not undermine the intended benefits of providing improved access to safe water. Demonstration of local ownership, maintenance and operating costs (through cash and/or in-kind contributions) will be considered in

the selection/prioritization process to leverage limited resources, improve successful implementation, and reduce continuous Project dependency.

4.3 Education and Youth Programs

The Sponsor has proposed supporting the educational sector by funding normal and special needs within the educational system (e.g., the purchase of school furniture, office equipment, computer workshops, textbooks, teaching materials, repair of school infrastructure and providing a permanent supply of bottled drinking water.) Other support could include financial assistance and a scholarship program for academic institutions and students associated with the mining and agricultural industries, including advanced range and agricultural management.

The Project has also sponsored the Iris Foundation, a orphanage in Ulaan Bataar, and other groups and foundations. Similarly, the Sponsor supported a number of scientific and technical events and conferences relating to small-scale mining; toxic metals, health and the environment; and environment.

Responding to concerns about at-risk youth, high levels of teen pregnancies, and STDs, the Project may develop and sponsor a variety of cultural programs and sports events.

4.4 Community Health

The baseline study, surveys and consultation highlighted that community health is amongst the leading issues of concern for local communities. Gastrointestinal disorders may be very common in both adults and children. Other health concerns relate to skin diseases and sexually transmitted diseases (STDs), early teen pregnancy, and abuse of alcohol and drugs among other key health concerns. No cases of HIV/AIDS are known or have been detected in this study, although such cases have been registered in the region.

To support efforts aimed at improving community health issues, the Sponsor proposes to support local health clinics, contributes to the government's preventative health campaigns, and an ambulance for emergency transportation. The Sponsor also responded to concerns about at-risk youth, which were already detailed in Section 4.3, further above.

The Sponsor will review and consider financial assistance and in-kind contributions to the following groups and initiatives:

- Transport of critically ill patients of the area to UB.
- Support of anti-drug and alcohol control initiatives

- Creation of an outpatient clinic at the site, staffed by certified medical personnel
- Visiting medical doctors and other humanitarian health campaigns

4.5 Economic Opportunities

The region is characterized by a high incidence of poverty. More than half of the population did not earn sufficient income to cover their basic needs and almost one quarter could not even afford to buy the basic “basket of goods”.

Recent official data were not available for the Soum level. Barriers to local economic development include lack of organization or size to become more effective businesses or cooperatives, as well as limited access to formal banking services. There is a bank at Shijiir Alt. Additional micro-finance service opportunities may also need to be explored through NGOs.

In addition to its preferred local employment policy, the Sponsor is committed to continuing its predominantly local sourcing of goods and services. However, the transition from exploration to construction will be accompanied by a significant surge in time-critical and quality assured demand. This is expected to exceed the local supply capabilities, even with the introduction of SME-linkages and a capacity building program for suppliers and service providers. All materials and most labor will need to be sourced from UB.

To provide a more enabling environment for local sourcing, some supporting initiatives may be required. An inventory of skills and availability of local workers is currently being developed to assist subcontractors with local hiring. Procurement processes may need to be refined to allow for smaller contract size and volumes of food products. Technical assistance, including access to finance, may be needed for micro and small-scale businesses and cooperatives to enable them to grow and improve their business management skills. However, some importation of goods and services from regional, national and international hubs (e.g., Ulaan Bataar) – particularly during the construction phase – is considered unavoidable.

In addition to meeting Project needs, the enabling business and income generation environment could also assist in developing the world-class tourism potential of the region. The area may need to reposition itself from being ‘the last gas station’ to becoming a ‘staging post’ for the many local excursions, including eco-tourists keen to explore the biodiversity in the area, as well as the Tuul River basin. The mining itself can be a point for tourism, as few tourists have seen placer mining.

4.6 Artisanal, Illegal “Ninja” Miners

Artisanal, illegal “ninja” mining boomed in the 1990s in the Tuul River mining region. This was the result of a combination of factors, including discovery of superficial alluvial gold deposits (which could be extracted with very basic technologies), high gold prices peaking over US \$500/ounce, and a fixed currency exchange mechanism (which excluded gold). A ‘bust’ followed the ‘gold rush’ after the government disbanded the preferential exchange rate mechanism, the world prices for gold dropped, and the more easily accessible alluvial deposits were largely depleted. Current high gold prices and occasional finds have led to more pressure for recent artisanal mining boom in the region, but the Mongolian government initiated a large crackdown on illegal artisanal mining about 5 years ago, reducing the local population of ninja miners from over 5000 to less than 300 in the Zaamar Soum.

The Global Mining Initiative’s Mining and Minerals and Sustainable Development (MMSD) project reviewed the challenges associated with the global artisanal mining sector and extracted important lessons³. These are being considered for the Tuul River mining region. The research highlighted the changing perception and an increasing recognition of the importance of this sector in terms of local livelihoods. It also noted the significant societal costs associated with artisanal mining. These include those associated with health, safety, environmental degradation (including potential mercury contamination); child labor issues; conflict with indigenous people; and other issues associated with the informal nature of artisanal mining activities.

Many environmental, health, and safety assistance programs have demonstrated that interventions should focus on incentives and training rather than on enforcement systems. It is important to show how protecting the environment or health can produce more benefits than costs. Encouragement and support for the formation of cooperatives, associations or enterprises to support communication, cooperation, and coordination between miners can provide important learning and networking opportunities as well as introduce benefits associated with economies of scale.

The MMSD report highlighted the work of the UN Department for Economic and Social Affairs, which was piloted in artisanal mining communities in Mali, Ethiopia, Ghana and Guinea. Lessons believed to be relevant to the Tuul River mining community include the need to promote small-scale mining as a catalyst and anchor for other productive activities leading to sustainable poverty

³ See also http://www.icmm.com/gmi_mmsd_project.php and http://www.iied.org/mmsd/activities/small_scale_mining.html

alleviation. Also, the application of participatory strategies that encouraged micro-enterprises and cooperatives, were considered to add significant value.

However, there is a significant difference between African artisanal mining which is indigenous and Mongolian artisanal mining which has only developed recently as result of unreclaimed tailings and poor mining practices in Zaamar region by licensed organized mining companies.

In recent years, the CASM (Community and Small-Scale Mining) initiative was launched by the UK Department for International Development (and hosted at the World Bank). It provides an instrument for coordinating experience, exchanging information, and channeling funds for related activities. A number of international NGOs, including the Intermediate Technology Development Group (ITDG), Conservation International, and the International Union Association have programs related to artisanal mining. The lack of access to finance is also particularly relevant to the artisanal mining communities. However, the MMSD study highlighted that rotating funds have not worked well and a more tailored approach, considering local context, may be required.

4.7 Nature Conservation and Biodiversity

The Big Bend area of the Tuul River basin and the Project area, in particular, were studied in detail as described in the SEIA. The Tuul River basin, including the mining area known as Big Bend, is within a designated mining district and has been subject to formal and informal mining-related activities for several decades. Most of the existing environmental degradation is a result of government sponsored dredging (wet and dry placer mining), as well as informal and small-scale mining activities. Key impacts are associated with overgrazing, mining, and land conversion, increased sediment loading in the river system, and possibly increased hunting pressure. Mongolians are not subsistence hunters or fishermen in most steppe areas, they exist by herding and agriculture.

No species of plants included on the IUCN Red List that were identified to the species level were observed at the Project site. The results of the SEIA and the design of the Project (including: limiting footprint, maintaining corridors for movement, selecting preferred Project alternatives, commitment to enforcement of no-hunting policies, applying good international mining practices) suggest no significant adverse biodiversity impacts associated with the Project. However, some residual risks and Project-unrelated issues of concern may remain. The former may be associated with the removal of vegetative cover, fragmentation and edge effects, and secondary impacts and anthropogenic pressures (land conversion, hunting) associated with potential spontaneous in-migration to the area. The latter includes Project-unrelated hunting (including cultural embedded activities) and impacts associated with controlled artisanal mining activities.

Furthermore, the results of public consultation and anthropological assessments highlighted the high value which herding communities, in particular, attach to their natural environment, especially the Mongolian view of open range and free movement throughout the rural steppe region.

4.8 Institutional Support and Capacity Building

The ‘frontier areas’ of the Tuul River mining district are characterized, in large part, by the periodic influx and out-migration of relatively large number of transient migrants (particularly including artisanal and small-scale miners). The Shijiir Alt settlement has developed outside of urban planning processes. The Mongolian government is not known to have initiated any housing initiatives in the area.

Considering the central role of effective local government in delivering quality of life improvements and economic development in the Local Areas of Influence, the Sponsor is considering partnership opportunities to support specific institutional capacity building measures with, and through, academic institutions, NGOs or consultants.

5.0 Scaling Up CDP Activities

5.1 Selection of Priority Projects

The initiatives detailed further below focus on community health, education, culture and youth development; artisanal mining; vocational training; access to water; nature conservation; and institutional capacity building. They all meet the key selection criteria defined in Section 4. Strategic alliances are being sought for each of these programs to mobilize additional expertise and resources, increase their scale, and improve their development impact and effectiveness.

5.2 Community Targets

Following the rapid survey described in Section 4, the Sponsor selected the communities of Zaamar and Shijiir Alt as possible recipients for its first investments in community development. Additional candidate communities for water related investments will need to be selected using criteria defined in Section 4.1, above.

5.3 Education, Culture and Youth Development

The Sponsor continues to support a variety of education, cultural and sports programs in Mongolia. The total budget allocation for these efforts for 2009 will be established in consultation with the Soumon Governors.

5.4 Community health

The Sponsor is committed to the construction of a public clinic (combined with housing for medical staff) at the site. Certified medical professionals will be assigned to attend to this medical facility. The Sponsor also shall consider donations and in-kind contributions to the rural clinics in Zaamar.

5.5 Vocational training and SME Linkage

The Sponsor's implementation plan, contract with its main contractors, and budgeting reflects its commitment to hiring local staff and providing vocational training. The latter may be outsourced and the Sponsor is exploring partnership opportunities to develop an appropriate vocational training program. Such a training program, which could be expanded in scope with the addition of external/additional funding resources, can result in the following benefits:

- Incorporate past and present land-users on the Big Bend Project site
- Create a pool of semi/skilled labor for recruitment by the Sponsor, contractors and other organizations
- Improve local capture of Project benefits associated with direct local employment and related cash flows through the communities
- Provide an attractive 'exit strategy' for artisanal miners keen to explore alternative employment opportunities
- Improve employment and livelihood prospects of trainees
- Operationalize sponsor's preferred local hiring policy and commitments

The nearest vocational and academic training center is located in UB the capital of Mongolia. The Save the Taimen Foundation, a non-profit organization dedicated to research in ichthyology and the natural sciences, technical education and training, and community development, will be considered for support.

There are several sites in UB which may be considered for vocational training and education for the region's most important industries – mining and herding, including advanced range management. The Sponsor is committed to support vocational training initiatives in 2009 and beyond, which is expected to increase

significantly once the operation has been fully permitted and construction is started.

In addition to the continuation of its approach to sourcing goods and services through local and national suppliers, the Sponsor will consider matching external resources which can support capacity building initiatives to further leverage local supply chain and SME linkages. Appropriate budgetary commitments will be considered for 2009 and beyond.

5.6 Illegal Artisanal Ninja Mining Control Program

The control of illegal artisanal ninja mining has been squarely addressed by the Mongolian government with impressive results, reducing the artisanal mining population in the Zaamar Soum from over 5000 to less than 300 in the past 5 years. However, additional artisanal mining pressure is expected. The Sponsor will work with the Mongolian government to address the issue of illegal ninja mining control.

5.7 Biodiversity Offset Strategy

The Sponsor is committed to working with recognized Mongolian and international conservation scientists and organizations in collaborating with the Ministry of Nature and Environment to develop suitable intervention opportunities to support nature conservation and a biodiversity offset program. There are two major elements of this offset strategy. First, grazing will be reduced or eliminated at the Big Bend site, thus increasing the biodiversity of the upland areas of the project area which are under contract with the Zaamar Soum. The second element of the biodiversity offset program is to create increased wetland, riparian, and open water habitats as an integral part of the placer mining process. These habitats are very valuable and attract many species in Mongolia. Additional scientific studies to further improve and catalogue the understanding of the regional ecosystem and its flora and fauna, as well as programs aimed at public education and awareness will be considered. The concept of a biological research station, or Biodiversity Center, has already been proposed. There may be other opportunities, both within the Project area and elsewhere in Mongolia, which could achieve similar or additional positive nature conservation impacts. They might include support of existing research, breeding, stream-rehabilitation, species re-introduction, eco-tourism and other programs benefiting one or more of the species (and their ecosystems) identified in Section 4. Some of these alternatives may provide new partnership opportunities and significantly leverage the Sponsor's own financial commitment. A Biodiversity Offset Concept has also been developed and is annexed to the SEIA. There will be no firearms allowed onsite, no hunting and no fishing allowed.

5.8 Institutional Capacity Building

The Sponsor will also consider matching external resources for institutional capacity building initiatives, which are designed to support local government institutions. Appropriate budgetary commitments will be considered for 2009.

6.0 Financing and Implementation

6.1 Sponsor's commitments

The Sponsor has a long history of commitment to responsible mining and range management in Mongolia since March 1993. The CDP budget, as well as its relative distribution, is still subject to review, incorporating outcome of additional public consultation activities, emergence of strategic alliances, and the construction start-up schedule. The objective of these reviews is to further integrate stakeholder consultations, CDP investment criteria, partnership and scaling opportunities, and the results of monitoring and evaluation. The Sponsor invites development and conservation institutions (particularly including NGOs) to express their interest to explore collaboration and partnership opportunities. Following the disclosure of the SEIA and this CDP, the Sponsor will be pursuing collaboration opportunities to maximize positive local development impacts and respond to existing challenges (see end of Section 1 for contact details).

Once the Project transitions from construction to its operational phase, the CDP budget and its scope will be reviewed again. The exact nature of this budgeting, financial distribution, and vehicles for disbursement, which may include a foundation structure, are still being considered.

Table 2 Project's CDP Budget Guidelines for 2009

Item	Activities	Tugrik	US \$	%
1	Education, health and sports	11450000	10000	22.2
2	Health clinic, community liaison	11450000	10000	22.2
3	Capacity building	5725000	5000	11.1
4	Scientific, NGO, conservation	5725000	5000	11.1
5	Vocational training	5725000	5000	11.1
6	Artisanal mining control	5725000	5000	11.1
7	Humanitarian aid	5725000	5000	11.1
Total		51525000	45000	100.0

Exchange rate used: US \$1.00 = Tg 1145

6.2 Monitoring and Evaluation

Current monitoring activities are primarily focused on tracking schedules and expenditures associated with the CDP. Specific qualitative and quantitative impact monitoring criteria will be established as part of project justification and funding commitments. Recipients of CDP funding will be requested to provide or contribute to formal monitoring and reporting requirements. Possible indicators for selected CDP elements are highlighted in Table 6. The use of these indicators is expected to improve intervention selection, project management, knowledge management, and allocation of scarce resources. The results of CDP investments will be disclosed as part of the Sponsor's periodic communications (newsletters) and annual reports.

Table 3 Sample Indicators

Activities	Possible Indicators	Reports
Water and sanitation	Number of people served; Water access and quality (before/after); Wastewater access (latrines/household or community) Local ownership (incl. future operating and maintenance costs); Level of gastrointestinal diseases, ; Capital invested & partnership or resources mobilized	Baseline conditions (justifying selection & intervention); Post-intervention report; Status/update report after 6-12 months by recipient
Education	Number of benefiting students/teachers or physical improvements; Changes in absenteeism (including due to gastrointestinal illnesses); Further educational advancement Capital invested & partnership or resources mobilized	Baseline conditions (justifying selection & intervention); Post-intervention report after completion; Brief annual report and additional needs by recipient
Community health	Pre- and post-incidences of the targeted diseases; Number of patients served by category of support (gastrointestinal, malaria, STDs); Define and track range of outcome expectations (track trend lines)	Baseline statistics; annual report by health clinic (copy of routine submissions to government agencies)
Employment and professional training	Local individuals undergoing vocational training; % of these hired by Project and main contractors; % staff hired from Local and Intermediate Areas of Influence; of these, % indigenous staff; track local pay and tax rolls	Companies internal management and external (annual) reporting
Economic and SME-linkage opportunities	Volume and value of local and national tenders and purchases; track impact on handful of suppliers of goods and services; External capacity building and resources mobilized	Testimonials of beneficiaries of capacity building and linkage program

Community Development Plan (CDP)

Appendix 1: Summary of Social Impacts and Mitigation Measures

CDP Appendix 1: Summary of Social Impacts and Mitigation Measures

ID	Activity/Action (Cause)	Potential Impact (Effect)	Proposed Mitigation Measures
SE1	Project infrastructure development and subsequent operational activities	Physical and/or economic relocation of persons living, working or otherwise using the Project property and access roads (impacts on access and usufruct rights)	<ul style="list-style-type: none"> • Analyze and implement range management issues, grazing • Develop and implement a Resettlement Action Plan (RAP) in line with World Bank standards, provide voluntary resettlement opportunities and improve the livelihoods of resettled individuals • Develop a Public Access Plan which: <ul style="list-style-type: none"> • Discourages new in-migration (especially new access to the Tuul River) • Employs surveillance (monitoring by guards) at key locations • Provides checkpoints at main roadways leading to the Project property • Provides regular patrolling of trails and right-of-ways • Includes minimizing and decommissioning of roads, trails, and right-of-ways
SE2	Increased population with increased access to range, mining, and other natural resources. New and improved roads and trails and the right-of-way may increase access.	Increased pressure on natural resources. Anthropogenic impacts on steppe vegetation, cover (deforestation), wildlife, and aquatic (fisheries) resources	<ul style="list-style-type: none"> • Develop and communicate Employment and Contracting Policies and Procedures that discourage spontaneous migration through preference to local hires and regional recruitment centers • Develop policies, procedures and training for employees and contractors related to overgrazing, clearing, hunting, fire, etc. • Develop a Public Access Plan
SE3	In-migration (spontaneous) due to real and perceived increased economic opportunities	Deterioration of already limited or ineffective basic infrastructure and social services	<ul style="list-style-type: none"> • Develop and communicate Employment and Contracting Policies and Procedures • Work with affected communities and government agencies to develop a priority list of actions/investments • Develop new partnerships, including with NGOs, to strengthen the institutional capacity of local government to provide social services and basic infrastructure • Encourage additional government investments and co-finance infrastructure and social service projects identified as priorities by local communities through the Community Development Program

CDP Appendix 1: Summary of Social Impacts and Mitigation Measures, continued

ID	Activity/Action (Cause)	Potential Impact (Effect)	Proposed Mitigation Measures
SE4	In-migration (planned and spontaneous) due to real and perceived increased economic opportunities	Deterioration in already poor public health conditions, including a possible increase in the incidence and spread of infectious and sexually transmitted diseases.	<ul style="list-style-type: none"> • Partner with organizations that can provide and/or improve effectiveness for community health workers, education of sex education workers, and other preventive and integrated health education programming • Collate (or develop/improve where needed) and monitor baseline health statistics in the Direct Local Area of Influence (including employees and contractors) • Partner with organizations to improve more effective prevention and treatment programs for malaria, and monitor outcomes • Encourage and co-finance investments in potable water and wastewater
SE5	In-migration (spontaneous) due to increased and perceived economic opportunities	Existing baseline conditions indicate elevated levels of violent crime, prostitution, drug trafficking and abuse, organized crime, illegal logging, hunting and wildlife trade. Depending upon its magnitude, potential spontaneous in-migration may add to these existing challenges	<ul style="list-style-type: none"> • Develop and communicate Employment and Contracting Policies and Procedures • Develop policies, procedures and training for employees and contractors related to forest clearing, hunting, fire, etc • Develop new partnerships and promote alternative livelihood and Project-related and unrelated economic opportunities (including through the Community Development Program and leveraging ecotourism opportunities) • Encourage local and regional institutional strengthening
SE6	In-migration (spontaneous) due to real and perceived increased economic opportunities	The local area is already characterized by unplanned settlements and growth and invasion of open spaces. A large-scale influx of additional migrants could further contribute to these problems as well	<ul style="list-style-type: none"> • Develop and communicate Employment and Contracting Policies and Procedures • Develop new partnerships with NGOs and others to strengthen the institutional capacity of local governments in the areas of urban planning, housing, zoning, cadastre and finance • Encourage additional official investments to support planned urban development.

ID	Activity/Action (Cause)	Potential Impact (Effect)	Proposed Mitigation Measures
SE7	Adverse cultural impacts on indigenous communities	Local rural herders and other people are already broadly integrated into the social environment, though they generally live in separate communities and maintain traditional governance and social codes. They could experience some loss of traditional cultures, customs and languages	<ul style="list-style-type: none"> • Promote indigenous language and cultural education in schools • Select Community Liaison and other staff with Mongolian language skills • Provide community outreach, monitoring report summaries, public consultation and other materials in indigenous language
SE8	Increased tensions from perceived preferential Employment and Procurement Policies and CDP, access/control over land and other natural resources, presence of non-local workforce, and Government removal of artisanal miners ¹	Increase of existing ethnic, cultural, and social tensions and conflicts between mining and herding groups, recent migrants, labor unions, and the Project workforce. Cultural clash and economic disparities between non-local workforce and residents.	<ul style="list-style-type: none"> • Implement a ‘semi-closed camp’ policy that minimizes conflicts between the ‘imported workforce’ and local residents • Ensure participatory development implementation of CDP and report on outcome • Collaborate with government on program for ninja mining control • Provide voluntary exit opportunities for artisanal miners through vocational training, employment and supply chain opportunities

CDP Appendix 1: Summary of Social Impacts and Mitigation Measures, continued

ID	Activity/Action (Cause)	Potential Impact (Effect)	Proposed Mitigation Measures
SE9	Time/task limited employment and associated planned layoffs at the end of the construction phase, and after end of operation	Pre-existing conditions include high level of unemployment, Additional cycles of employment and unemployment, and economic growth and contraction that might be associated with different stages of Project life cycle.	<ul style="list-style-type: none"> • Provide training opportunities to local people to improve their employability and transition to other projects and/or sectors • Support the establishment of local financial services (potentially including NGO intermediaries) to promote personal savings and allow employees to bridge employment and income gaps • Support the development of micro-enterprise and alternative income generating activities • Create a “job bank” in cooperation with other employers in the region • Develop a consistent message “Project jobs are not work for life” • Give preference to local outsourcing, including small-scale suppliers • Develop partnerships and provide technical assistance to accelerate scale-up of local supply chain
SE10	Visual and aesthetic impacts associated with excavation, overgrazing, light pollution, etc.	Deterioration in landscape quality with possible economic, environmental and sociocultural repercussions	<ul style="list-style-type: none"> • Limit Project footprint, height of facilities, and visual impacts as feasible • Develop a Decommissioning and Restoration Plan which blends mine site into its surrounding, increase wetlands, riparian, and open water habitats

Project-unrelated removal of artisanal miners in the Tuul River district by the Government (through the National Police) as part of a national campaign to thwart illegal mining activities.

Environmental Management and Monitoring Plan

Social and Environmental Management and Monitoring Program

Big Bend Placer Gold Mining Project



Prepared for



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October 2008

Executive Summary

This document discusses the Social and Environmental Management and Monitoring Plan (SEMMP) of the Big Bend Placer Gold Mining Project in Mongolia. The document is a detailed compilation of: all of the standards that the Project needs to meet (see **Appendix 2**); description of all the management measures that will be taken which are based on the results of the impact evaluation process discussed in the Social and Environmental Impact Assessment (SEIA); the company management and training necessary to implement these mitigation measures; as well as, environmental monitoring procedures to ensure that the mitigation measures are working as planned or if adjustments need to be made. These plans will be used as an initial guideline for implementation, and may be modified based on new Project information, regulatory requirements, or adjusted for field conditions as necessary.



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List of Abbreviations and Acronyms

°C	degrees Celsius
µg/m ³	micrograms per cubic meter
BBC	Breeding Bird Census
BOD	Biological Oxygen Demand
Company	WM Mining Company, LLC
dB	decibel
dBA	A-weighted sound pressure level
dBC	C-weighted sound pressure level
EPT Organisms	Ephemeroptera (Mayflies), Plecoptera (Stoneflies), and Trichoptera (Caddisflies) group
ESHS	environmental, social, health and safety
GIIP	Good International Industry Procedures
HDPE	high-density polyethylene
M	meter
meq/L	milliequivalents per liter
mg/L	milligrams per liter
mg/m ³	milligrams per cubic meter
MSDS	Material Safety Data Sheets
NTUs	nephelometric turbidity units
PM	particulate matter
PPE	Personal Protective Equipment
QA/QC	Quality Assurance/Quality Control
RBPs	Rapid Bioassessment Protocols
SAPP	Sensitive Areas Protection Plan
SEIA	Social and Environmental Impact Assessment
SEMMP	Social and Environmental Management and Monitoring Plan
SPCC	Spill Prevention, Control and Countermeasure Plan
T&E	threatened and endangered
TCUs	true color units
TPHs	total petroleum hydrocarbons
TSS	Total Suspended Solids
US	United States
USGS	US Geological Survey
WHO	World Health Organization

1.0 Environmental, Social, Health, and Safety Policy of WM Mining Company, LLC

WM Mining Company, LLC's (Company's) policy on the environment, health and safety is to:

- **Achieve safe and incident-free operations:** Provide a safe and healthy workplace for all employees and contractors on Company sites. Operate and maintain Company facilities and sites in a way that will not adversely affect the health and safety of Company's neighbors and general public, or the environment.
- **Integrate environmental, social, health and safety (ESHS) matters into Company business and corporate values:** Assess risks to the environment, health and safety as part of all business decisions. Ensure environmental, social, health and safety objectives are part of the Company's business planning process.
- **Ensure compliance:** Verify compliance with national regulations, conformance with international standards and with the company's environment, health and safety management policies at all levels through regular internal auditing. Ensure that Company performance is consistent with stakeholder expectations.
- **Consult with employees:** Provide Company employees with opportunities to contribute to the making of decisions affecting the environment and their health, safety and welfare at work.
- **Ensure that all who work with the Company, work in accordance with this policy:** Train and motivate employees, business partners and contractors so that they understand their environment, health and safety roles and responsibilities, and have the tools (or systems in place) to achieve a safe, secure, reliable, efficient, incident-free and environmentally sound operation.
- **Utilize risk management practices:** Apply sound risk management principles to identify, communicate and control workplace hazards. Aim to remove hazards so incidents and injuries do not occur.
- **Achieve ongoing improvement:** Plan to continually improve Company environment, health and safety performance and monitor Company improvement against world-class targets.
- **Build community partnerships:** Communicate openly with government and the community on environment, health and safety policies and performance.
- **Reduce Company environmental impact:** Continually improve processes and products to conserve company and natural resources, increase energy efficiency, prevent pollution and minimize waste.

- **Be prepared for emergencies:** Prevent incidents as a first priority but be prepared for any emergency and mitigate the effect of all incidents quickly and effectively.
- **Be accountable:** Hold all employees and contractors accountable for environment, health and safety performance in their area.

2.0 Regulatory Compliance Program

WMMC intends to perform its mining operations in compliance with all prevailing regulations and requirements for this Project. To ensure regulatory compliance, supervisory positions have been created and defined. These positions are defined below.

- **Chief Operating Officer (COO):** The COO will oversee the overall Project activities. This position will be located in Ulaanbaatar. The COO will be ultimately responsible for emergency preparation and ensuring that the response plan is in place and ready to be implemented. The COO will be directly involved in permitting and compliance, as well as social and environmental management.
- **On-Site Manager:** The On-Site Manager will oversee all of the operations at the Project area. This person will be responsible for ensuring that the Mine Camp and mess hall operations run well, that the Mine Camp is properly supplied, and that diesel fuel and lube are adequate for mine operations. This person will supervise the activities of the Mine Camp and workshop staff as well as oversee the tasks of the security officers and the ESHS Manager. The On-Site Manager will supervise all mining operations in the field. The On-Site Manager will be responsible for ensuring that the appropriate Emergency Response Plan is implemented for incidents at the Project area. The On-Site Manager will report to the COO in Ulaanbaatar and coordinate with the Office Manager in Ulaanbaatar for day-to-day operations. During emergencies, this person will be the primary coordinator at the Project area.
- **ESHS Manager:** The ESHS will be present at the Project area to coordinate environmental, social, and health and safety activities. The ESHS Manager will:
 - Ensure that all mining operations are in compliance with all prevailing regulations and requirements for the Project.
 - Implement all the social and environmental mitigation measures adopted in the SEIA and this SEMMP to ensure that all operations are in compliance with all prevailing regulations and requirements for this Project.
 - Represent the Company in the local community to address issues that come up, and facilitate their resolution.

- Conduct routine inspections of all pollution prevention, mitigation and reclamation measures installed at the site.
- Prepare and file all ESHS reports related to the Project as required by Mongolian legislation, and immediately transmit copies of such reports to the applicable persons.
- Ensure that all personnel employed on the Project are adequately trained and knowledgeable in the application of all applicable ESHS regulations.
- Ensure that the appropriate Emergency Response Plan is implemented for incidents at the dredge or floating process plant.
- Assist the On-Site Manager in implementing the Emergency Response Plan during emergencies.
- Dredge Supervisor: The Dredge Supervisor will oversee all dredging and processing operations in the field. This person will be assisted by a geologist to ensure that dredging operations will run smoothly. The overall direction of field operations will be coordinated with the Chief Geologist. The first person on the scene of an accident will contact the Dredge Supervisor and the Safety Officer (defined below) to report the incident. The Dredge Supervisor will then implement the appropriate response and report to the ESHS Manager and the On-Site Manager.
- Safety Officer: One person at each dredge and floating process plant will be the Safety Officer, who will be responsible for all safety issues during that shift. The individual Safety Officers will work with the ESHS Manager to ensure that all health and safety requirements are met. The Safety Officer will be responsible for ensuring that the Emergency Response Plan is implemented at the assigned dredge.

3.0 Environmental Monitoring Programs

This section presents a discussion of the proposed environmental monitoring program for the Project. The proposed monitoring program presented herein may be modified by the Project operators and regulatory authorities as detailed mine planning progresses on the Project.

The primary purpose of the monitoring program is to assure that the Project is in compliance with Mongolian operating permits and environmental regulations, and to evaluate the effectiveness of the environmental mitigation. The results of the monitoring program will be reviewed by Project management on a periodic basis. If adverse environmental changes occur as a result of the Project, then appropriate remedial measures will be implemented to reduce or eliminate Project-related effects.

In addition to the responsibilities previously noted, the ESHS Manager will:

- Establish and maintain a central location for all relevant and prevailing national regulations and international standards;
- Conduct periodic checks for regulatory updates/changes;
- Perform periodic compliance assessments;
- Monitor the implementation of corporate ESHS requirements;
- Ensure that employee training includes regulatory compliance;
- Ensure that updated and adequate notices and postings of requirements and regulations are in place;
- Open a communication channel for non-compliance reports and feedback to come in and ensure that these matters are followed up and corrected where necessary;
- Work with the On-Site Manager to ensure that camp health and safety standards are met; and
- Ensure that Remedial Action recommendations in Incident Reports are followed within a reasonable time period.

Environmental monitoring will be conducted on the following environmental components.

3.1 Meteorology and Air Quality

An air quality and meteorology monitoring program will be implemented for the Project. Air quality monitoring for total suspended particulates will involve both the collection of ambient air samples and inspection of mining equipment. For the collection of ambient air samples, sampling stations will be at the same location year after year to help improve the consistency of monitoring results. Visual inspection of operating equipment and routine maintenance will be part of the regular operating procedures, and will be documented and reviewed by the On-Site Manager as appropriate.

A meteorological station will be installed at the Mine Camp. The nearest meteorological station is located on the other side of the Zaamar Mountains, in the Zaamar Soum Center, a distance of 30 km from the Project area.

3.1.1 Parameters to be Monitored

The primary pollutant parameters resultant from mining operations will be fugitive dust, and gaseous emissions of nitrous and sulfur oxides. Since gaseous emissions will be minor based on diesel fuel consumption rates, and dispersion characteristics of the region are generally good, no monitoring of gaseous emissions is proposed. A monitoring plan for fugitive dust (particulate matter with an aerodynamic diameter of 10 micrometers or less [PM₁₀] and total suspended

particulates [TSP]) will be conducted, with a description of the location of sampling stations, sampling frequency, and parameters to be sampled during the life of the Project.

For the meteorological station, temperature, relative humidity, wind speed, wind direction, solar radiation and rainfall data will be measured.

3.1.2 Sample Site Locations

A portable minivol sampler or similar air quality monitoring device will be used to monitor for PM₁₀ and TSP at select locations. The sampler will be deployed upwind (for background concentrations) and downwind of active Project operations (overburden removal and disposal sites, tailings, and reclamation sites), and at the Mine Camp.

A ten-meter meteorological tower will be installed on-site at the Mine Camp.

3.1.3 Frequency of Monitoring

Monthly sampling of ambient atmospheric PM₁₀ and TSP concentrations at the locations specified above using 24-hour averages and calculation of maximum daily values will be sufficient to confirm compliance with air quality standards. Should monitoring results indicate air quality exceedances, then more frequent monitoring would occur, and corrective actions taken to reduce dust. Monitoring locations and frequency are adequate for protection of human health as the Project site is at a remote location with a relatively large airshed, there are no significant emission sources, and monitoring sites are already located at the most sizable population centers.

Meteorological data will be collected continuously and stored in a programmable solid-state datalogger.

After cessation of mining and reclamation activities, no additional air quality sampling will be conducted at these locations.

3.1.4 Monitoring Techniques and Procedures

Portable minivol air quality samplers will be used to measure PM₁₀ and TSP. These are versatile cost-effective samplers for monitoring air quality. They are especially ideal for sampling air quality in remote locations where no permanent site has been established.

Minivol samplers will be installed at specified locations for a 24-hour period. At the end of the period, the filter units will be extracted from the sampler, and sent to a laboratory for analysis. Quality Assurance/Quality Control (QA/QC) procedures will follow the guidelines specified in the minivol manual. A record of calibrations and adjustments made will be kept in an equipment logbook. On-site personnel will be trained in the use and maintenance of the equipment by a qualified consultant.

A ten-meter meteorological tower will be installed on-site. The appropriate sensors will be installed on the tower and connected to the programmable datalogger. The datalogger will store data relayed from the sensor. Every two to four weeks, the stored data will be retrieved from the datalogger and analyzed. QA/QC procedures will be implemented during all phases of the program.

3.1.5 Reporting

Results of the air quality and meteorological data analysis will be reported directly to the On-Site Manager. A copy of the results will be presented to the appropriate central and local government offices in an Annual Environmental Report.

3.2 Terrestrial Ecology: Soils, Vegetation, and Wildlife

3.2.1 Soils

Placer mining operations have little impact on soils outside of the mining area. Within the mining area, there will be earth movement and soil profiles will be altered, but reclamation activities will restore soil productivity and minimize impacts. Plans are in place to preserve topsoil for future reclamation efforts, which will be stripped and stockpiled separately from other overburden materials. Removal of overburden and spoils will be done in a manner that will minimize drastic changes to the landscape and result in a stable slope.

One major task for soil monitoring in a placer mining region would be, therefore, the monitoring of how well the topsoils are preserved and how well the erosion control measures are working there.

Conventional soil monitoring will be conducted in areas where Project operations may result in soil contamination. One such area is the fuel depot center, where there is potential soil contamination from accidental spills.

3.2.1.1 Parameters to be Monitored

Regular inspection and maintenance are required to ensure an effective erosion and sedimentation control program. Visual inspection of the erosion and sedimentation control structures surrounding overburden stockpiles and settling ponds will be conducted. Inspections during or after storm events (when failure is likely to occur) will also be made. Downstream water quality will be sampled as an increase in TSS may be an indication that erosion control structures upstream are not working properly.

Topsoil preservation and slope stability of spoils will be monitored by observing the Project operations and condition of the erosion/sedimentation control structures and earth piles. A separate topsoil stockpile will be in use and protected from erosion. The spoils pile will have a gentle slope that is stabilized from sliding. Observations will also be made to determine if there are any signs of erosion (gullies, rills, slumping).

For soil contamination at the fuel depot/workshop, total petroleum hydrocarbons (TPHs) in soil samples will be analyzed.

Erosion and sediment control structures will be monitored to ensure that they are working properly.

3.2.1.2 Sample Site Locations

Visual inspection of topsoil stockpiles will be made mainly along the down slope of the stockpiles as well as where erosion control measures will be implemented.

One sample will be collected at the fuel depot center where it is down slope from and close enough to the storage tanks to detect any leaks and migration of fuel.

3.2.1.3 Frequency of Monitoring

During the wet season, inspection of erosion and sedimentation control structures and topsoil stockpiles will be made every two weeks. Inspection of all earth piles will also be conducted during or immediately after a storm event to check the effectiveness of the erosion control measures and stability of the stockpile. Spoil piles that are currently active will be inspected every two weeks while the others will be inspected once every two months.

Soil sampling at the fuel depot center will be conducted twice a year.

3.2.1.4 Monitoring Techniques and Procedures

Monitoring for topsoil preservation and spoil pile stability will be made by visual inspection of the respective earth piles.

Monitoring of soil quality will be made by collecting a soil sample and sending it to an analytical laboratory.

All observations will be recorded in a notebook, and followed up with the appropriate manager.

3.2.1.5 Reporting

Monitoring results will be included in a weekly report to the On-Site Manager. Laboratory results of the soil quality analysis will be reported directly to the On-Site ESHS Manager for inclusion into a regular report. A copy of the results will be presented to the appropriate central and local government offices in an Annual Environmental Report.

3.2.2 Vegetation

Annual environmental monitoring for vegetation will be conducted to determine reclamation success. The results will be compared against the initial baseline survey that will be conducted prior to any disturbance. The principal purpose behind environmental monitoring for vegetation is to improve the accuracy of impact assessment through annual inventory of key species groups in the Project area, and GIS-referenced population data and species presence/absence data, especially for threatened and endangered (T&E) species. This monitoring program is important in gaging the effects of Project activities on vegetation and as a report card of the overall ecosystem health of the Project area.

3.2.2.1 Parameters to be Monitored

Several key aspects of the vegetation in the Project area will be monitored annually, including:

- Monitoring the ecosystem health in terms of species composition, documenting loss or appearance of plant species through annual inventories;
- Using GIS remote sensing technology to monitor and document progress of reclamation and revegetation; and
- Investigating and documenting potential links between changes in vegetation and Project-related activities.

Application of a vegetation monitoring system will include two main components, GIS-remote sensing technology with the elaboration of a GIS-based supervised vegetation classification and an annual field sampling/analysis of vegetation structure and composition using quadrat and transect field sampling methodologies.

3.2.2.2 Sample Site Locations

Exact sampling locations for vegetation monitoring are to be determined on-site.

3.2.2.3 Frequency of Monitoring

The frequency of monitoring for vegetation will be annually, employing field and remote sensing studies.

3.2.2.4 Monitoring Techniques and Procedures

Monitoring and baseline field sampling techniques for vegetation will employ quadrat and transect sampling methods in profiling the composition/structure of the steppe and wetland/riparian vegetation communities. Among the five commonly employed methodologies for grassland vegetation (quadrats, transects, point methods, distance methods, and gradsects), quadrat sampling is the most widely used type of methodology employed in plot sampling, accurately representing true populations sizes (Sorrells and Glenn, 1991).

Quadrat Methodology

Quadrats are small, square-shaped sampling areas, used commonly in community ecology studies of grasslands. Quadrat size is determined based on vegetation cover; a typical quadrat size for temperate grassland is two square meters.

Transect Methodology

Transect methods will be used to estimate species vegetation coverage (population) as this method is more accurate than quadrats in grassland vegetation, (Sorrells and Glenn, 1991; Bauer, 1943). Transects will also be used in rapid assessment of species cover and composition being used as a time effective tool in comparing vegetation cover of two different localities in the Project area.

A transect length for grasslands is a 50-meter (m) straight distance, over which interval all individual stems intercepting the transect line will be inventoried.

Quadrat Methodology

Quadrats are small, square-shaped sampling areas, used commonly in community ecology studies of grasslands. Quadrat size is determined based on vegetation cover; a typical quadrat size for temperate grassland is two square meters.

3.2.2.5 Reporting

An annual terrestrial ecology report will be prepared, describing sampling locations, methods and material, data analysis, results and conclusions. This report will be submitted to the On-Site Manager. A copy of the results will be presented to the appropriate central and local government offices in an Annual Environmental Report.

3.2.3 Wildlife

3.2.3.1 Parameters to be Monitored

Wildlife groups that will be monitored include mammals and birds. Aquatic organisms that will be monitored are discussed later under Aquatic Ecology. Inventory/census and population data are important tools for monitoring wildlife and evaluating the impact of Project activities. Species absence/presence and populations of wildlife in the Project area are parameters subjected to noise, general habitat alteration, degradation and fragmentation and respond in different ways to impacts. Improved baselines (in terms of inventory and census data for invertebrates, birds and mammals) provide important tools for accurately analyzing Project impacts to terrestrial and aquatic faunal ecology.

3.2.3.2 Sample Site Locations

Sample site locations will cover all major habitat types in the Project area for mammals and birds, including wetland/riparian, steppe and upland grassland steppe.

3.2.3.3 Frequency of Monitoring

Monitoring of wildlife will occur as a yearly census and inventory of mammal and bird fauna.

3.2.3.4 Monitoring Techniques and Procedures

With respect to mammals and birds, census data are particularly challenging to acquire owing to the highly mobile nature of individuals in each species. Capture-recapture or mark-recapture sampling techniques for sampling populations across mammal and bird species are standard field methodologies in the most precise census studies. Such methodologies, however, are only recommended here in this section for small mammals.

While often providing the greatest degree of accuracy in population estimates, capture-recapture or mark-recapture sampling techniques are considered beyond the scope of these recommendations for monitoring studies for two reasons. First, an appreciable number of species occur between mammals and birds, and secondly, the capture of T&E species that potentially occur in the Project area is a sensitive consideration. Because of this, transect sampling offers several important advantages: reliable comparative estimates of abundance that are widely used and less labor intensive (Buckland et al., 1993).

Mammals

During annual monitoring, two principal sampling strategies for mammal sampling will be employed in collecting inventory and census data for species present in the Project area. Small mammals such as rodents are particularly difficult to census because of their size and often nocturnal habitats. For this reason, rodents and other small mammals will be sampled using Sherman™ live traps and a capture-recapture approach. Traps will be systematically placed in disturbed areas impacted by Project activities, in addition to other areas experiencing a relatively low degree of impact.

Contrastingly, transects as opposed to capture-recapture or mark-recapture strategies will be employed in the sampling and general inventory/census for large carnivorous mammals such as the fox and steppe polecat.

Birds

Birds are the largest and most prominent faunal group in the Project area, in addition to being the largest category with respect to potential presence of T&E species. Once an accurate census has been established for avifauna in the Project area, a monitoring program initiative will focus on a quarterly census of bird species and population counts per species to track the presence/absence of species, including T&E species and their population numbers.

Breeding Bird Census

A Breeding Bird Census (BBC) is a key initiative to improving baseline information for avifauna. Originally developed by the United States (US) Bureau

of Biological Survey, a BBC has been used to track bird populations over time and is administered by the Cornell University Laboratory of Ornithology (Taub, 1990). Birds are difficult to conclusively inventory or census for a particular area because of the often constant changes in distribution and abundance between species.

A BBC program will be designed to approximate as accurately as possible an "inventory" of bird species over a discrete area and will be based on study plots established across singular habitat types. Once plots have been established, standard methods will be used to collect census data, which over time, through a monitoring program, will provide a diagnostic tool for changes which may occur in the population of breeding birds in relation to impacts in the Project area and Project activities.

Establishing a BBC and monitoring program for the Project area will be a key tool in assessing Project activity impacts to birds, providing an accurate inventory of avifauna and population data over time, an aspect which characteristically changes for many species.

A monitoring program for avifauna will consider a quarterly census of bird species and population counts per species.

3.2.3.5 Reporting

An annual wildlife report will be prepared, describing sampling locations, methods and materials used, data analysis, results and conclusions. This report will be submitted to the On-Site Manager. A copy of the results will be presented to the appropriate central and local government offices in an Annual Environmental Report.

3.3 Aquatics: Hydrology, Water Quality, Ecology

3.3.1 Hydrology

3.3.1.1 Sample Site Locations

The following Tuul River gaging locations may be selected based on the proposed Project activities. These river gaging locations coincide with surface water monitoring locations:

- Site S-110 – upstream of Tuul River Bridge (upstream control point);
- Site S-120 – Project area upstream sampling point;
- Site S-130 – mid-Project area sampling point;
- Site S-140 – Project area downstream sampling point; and
- Site S-150 – downstream control point.

3.3.1.2 Parameters to be Monitored

The river gaging locations will measure the river water flow at each sampling location on the Tuul River.

3.3.1.3 Frequency

Stream gaging will be conducted as a minimum during the active mining season (April through November), and possibly year-round. Stage measurements will be collected on a daily basis or more frequently if data loggers are used.

3.3.1.4 Monitoring Techniques and Procedures

Stream gaging will be conducted according to US Geological Survey (USGS) protocols (Rantz, 1982) or similar international methods. At wadeable segments of the Tuul River, USGS flow measurement protocol may be used, including a top setting rod and an electromagnetic or mechanical velocity meter. If the water is too deep for wading, then the measurement will be made either from a bridge or a boat. If the measurement is made from a bridge or a boat, then the meter will be suspended on a thin cable wound on a reel. A weight will be attached below the meter to permit it to be lowered into the water and to hold it in position once submerged.

Measuring the Tuul River discharge will be accomplished by measurement of water levels at the established gaging stations in the Tuul River and developing rating curves that relate stages to discharges at gaging stations. A series of independent discharge measurements and associated stage measurements will need to be collected at each of the gaging stations. The flow measurements used to develop the rating curve must bracket the lowest and highest flows encountered. Stage will be measured with bubbler-type pressure sensors that directly measure water pressure and relate this value to stage. A possibility of using data loggers will be evaluated. Protective devices will be needed for data loggers to prevent vandalism.

Additional discharge measurements are required periodically to detect and track changes even after a stage/discharge rating is well established. On a stable stream,

periodic measurements are made every six to eight weeks to verify that the relation has not undergone some unrecognized change. The stage-discharge relation will be unstable, changing with time and with the flow conditions, if the streambed or the hydraulic roughness is changing (as might occur with a sand-bed stream). In such cases, more frequent measurements (about weekly) will be needed to define how the rating curve is changing and to define its present condition.

On-site personnel will be trained in the use and maintenance of the equipment by a qualified consultant.

3.3.1.5 Reporting

Stream gaging data will be reported directly to the On-Site Manager. A copy of the results will be presented to the appropriate central and local government offices in an Annual Environmental Report.

3.3.2 Water Quality

The primary focus of surface water monitoring is to ensure compliance with Mongolian regulations regarding placer mining operations and to check on the effectiveness of the mitigation measures employed to protect water quality in the Tuul River. Dredge and sediment ponds are designed to protect the Tuul River and intercept runoff from mine operation disturbance areas. Monitoring will also protect WMMC from water quality impacts caused by other mining operations upstream of the Project area.

3.3.2.1 Parameters to be Monitored

The parameters for surface water monitoring will be those listed in **Appendix 2**. The Tuul River in the Project area is classified as Class 2. These parameters include measurement of physical characteristics, mineral content, nutrients, bacteria and toxic substances. Leaks from equipment will also be monitored for corrective action.

3.3.2.2 Sample Site Locations

The following surface water sampling sites are selected based on the operations proposed in the current development plan. Locations of proposed sampling sites may change as mining progresses throughout the life of the Project.

- Site S-110 – upstream of Tuul River Bridge (upstream control point);
- Site S-120 – Project area upstream sampling point;
- Site S-130 – mid-Project area sampling point;
- Site S-140 – Project area downstream sampling point; and
- Site S-150 – downstream control point.

3.3.2.3 Frequency of Monitoring

Collection and analysis of depth-integrated water samples will be conducted on a monthly basis during the active mining season (April through November) for field parameters and suspended sediment. The full suite of parameters will be performed once every two months during the active mining season (April through November). Daily inspection of leaks from equipment will be conducted.

3.3.2.4 Monitoring Techniques and Procedures

Water quality samples will be collected according to standard field protocols (EPA, 1983) or similar western methods. Portable field instruments will be used to measure degradable water quality parameters such as pH, dissolved oxygen, temperature, alkalinity, etc. in situ at each sampling site. Field instruments will be calibrated each day with a record of calibrations kept in a log.

- pH will be measured with a portable Fischer Scientific Accumet AP61 pH meter. Calibration will be performed each day to standard buffer solutions of pH 4 and pH 10.
- Water temperature, dissolved oxygen and conductivity will be measured with a portable YSI Model 85 meter. The dissolved oxygen sensor will be calibrated in saturated air several times each day. The conductivity sensor will be calibrated in the laboratory using a standard solution.
- Alkalinity measurements will be determined in the field by titration to a colorimetric end point corresponding to a specific pH using a Hach alkalinity test kit. Titrations will be performed with a digital titrator with 1.6N H₂SO₄ as the titrating agent, a 100 milliliter sample volume, and phenolphthalein and bromocresol green-methyl red indicators (pH 8.3 and 4.8 endpoints, respectively).
- Turbidity will be measured with a Hach 2100P portable turbidity meter.

Depth-integrated water samples will be collected in clean, properly labeled sample bottles. Samples will be kept cold at 4 °C in an ice chest or refrigerator until chemical analysis. Water samples will be transported by vehicle to

Ulaanbaatar to a reputable laboratory for analysis. QA/QC procedures will be followed including field blanks, duplicates, and laboratory spikes. A subset of the water samples may be sent to another independent laboratory to ensure the quality of the data from the laboratory in Ulaanbaatar. For dissolved analyses, water will be pumped through a Geotech 0.45 micrometer disposable filter into a clean, labeled bottle with a hand pump. For raw water analyses (unfiltered), water will be poured into the properly labeled sample bottle.

Parameters for the laboratory analysis will be those listed in the 3rd Attachment to the Joint Directive of the Minister of Nature and Environment, and the Minister of Health, No. 143/a/352 of 1997. These parameters include measurement of physical characteristics, mineral content, nutrients, bacteria and toxic substances. A list can be found in **Appendix 2**.

It is expected that for each sampling location, the following set of sample bottles will be used:

- 500 mL high-density polyethylene (HDPE) plastic bottle: raw water sample for general parameters, TDS, TSS, cations and anions;
- 50 mL plastic tube: raw water sample for conductivity;
- 250 mL HDPE plastic bottle: filtered water sample for chloride, sulfate, ortho-phosphate, nitrate/nitrate, etc.
- 250 mL HDPE plastic bottle: raw water sample preserved with HNO₃ for total metals analysis;
- 125 mL HDPE plastic bottle: filtered water sample preserved with HNO₃ for dissolved metals analysis;
- 250 mL glass bottle: filtered water sample preserved with H₂SO₄ for DOC analysis;
- 250 mL glass bottle: raw water sample preserved with H₂SO₄ for TOC, ammonia, and total phosphorus analysis.

The samples will be kept cold in a refrigerator until ready for shipment. Completed chain-of-custody forms will be filled and kept on record.

On-site personnel will be trained in the use and maintenance of the equipment by a qualified consultant.

3.3.2.5 Reporting

Laboratory results of the surface water quality analysis will be reported directly to the On-Site Manager. A copy of the results will be presented to the appropriate central and local government offices in an Annual Environmental Report.

3.3.3 Aquatic Ecology

An aquatic ecology monitoring program of the Tuul River will be implemented for the Project to obtain basic environmental baseline information on fish, benthic macroinvertebrates and algae in the Project region, and to monitor the potential impacts of the Project on resident aquatic life. The aquatic ecology monitoring program will be based on a modification of the Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers (Barbour et al., 1999). Biosurvey techniques, such as Rapid Bioassessment Protocols, are best used for detecting aquatic life impairments and assessing their relative severity (Barbour et al., 1999).

3.3.3.1 Fisheries Monitoring Program

Fish are an important component of the aquatic ecosystem of the Tuul River, and are of interest from an ecological perspective, as they are an indicator of the overall health of the system. In the Project region, the ecology of the Tuul River has been changed by mining activities and sediment loads, resulting in the local decline of sensitive fishes in favor of sediment-tolerant fishes. As such, a fisheries monitoring program will be conducted annually.

The Tuul River represents a challenging, fast-flowing environment in which to capture fishes. Several different techniques will be required to adequately survey fisheries in the Project area. The principal methodology that represents the least selective form of gear is electrofishing. Electrofishing utilizes a portable backpack generator and transformer to introduce an electric field into the water using a pair of electrodes (one cathode and one anode). Most fish exhibit a positive electrotaxis, and swim toward the anode. A commercial Electrofishing Unit will be utilized to sample selected pools and shallows, along defined transects. In addition, some selective electrofishing will be performed in riverine habitats, sloughs, and backwaters. Fish that are captured by netting stunned individuals are placed into holding buckets with air supplies. The fish will be identified, weighed, measured, and a scale taken for aging purposes. Digital photographs will be taken. Viable individuals will be returned to the stream. It will be possible to tag a number of individuals of selected species with markers or locator tags for further research into fish movement and behavior (if required). Catch per unit effort will be calculated based upon the actual recorded shocking time. Ages will be determined using regression analysis of scale samples. Condition factors will be calculated for key species. Species diversity and distribution will be reported.

Netting, seining, trot lining, and hook and line sampling methods will also be employed as required to capture representative fishes. Forage fishes will be captured with small minnow traps installed in the Tuul River within, upstream and downstream of the Project area. Baited hoop nets may be utilized to capture

bottom-feeding fishes would they be determined to be present. The annual fishery survey will be conducted in the latter part of the summer during low flow periods.

3.3.3.2 Benthic Macroinvertebrates

Periodic environmental monitoring of benthic macroinvertebrates will focus on the "pollution sensitive" Ephemeroptera (Mayflies), Plecoptera (Stoneflies), and Trichoptera (Caddisflies) group (known as EPT organisms). These macroinvertebrates are generally considered as reliable indicators of water quality. The more EPT organisms which are found, typically the better the water quality is; thus widespread use has been made of EPT as a taxa richness metric and one that varies directly with water quality (Lenat and Penrose, 1996; Wallace et al., 1996; Plafkin et al. 1989). Benthic macroinvertebrates will thus be a central component of aquatic ecology monitoring.

Parameters to be Monitored

The aquatic ecology monitoring program will utilize Rapid Bioassessment Protocols (RBPs) to monitor and evaluate:

- The physical habitat quality (available cover, embeddedness, pool substrate characterization, velocity-depth regimes, pool variability, sediment deposition, channel flow status, channel alteration, frequency of riffles, channel sinuosity, bank stability, bank vegetative protection, riparian vegetative zone width, etc.);
- Water quality (physicochemical constituents);
- Periphyton assemblages;
- Benthic macroinvertebrate assemblages; and
- Fish assemblages.

There are several metrics of Biotic Integrity that will be used for ecological and statistical analysis of the periphyton, macroinvertebrate and fish. Some of these include:

- Species richness;
- Shannon diversity index;
- Percent community similarity;
- Pollution tolerant index;
- Percent sensitive taxa (sum of relative abundance of all intolerant taxa);
- Percent EPT for benthic macroinvertebrates;
- Impairment of ecological conditions; and
- Other metrics.

The various metrics that can be used to evaluate environmental impacts are described in Barbour et al. (1999).

Sample Site Locations

Aquatic ecology monitoring is proposed for the following locations in the Tuul River:

- Site S-110 – upstream of Tuul River Bridge (upstream control point);
- Project area upstream sampling point (S-112 in July 2008);
- Site S-130 – mid-Project area sampling point;
- Project area downstream sampling point (S-135 in July 2008); and
- Site S-150 – downstream control point.

Additional monitoring sites in the Tuul River may be selected based upon locations of active mining sites and further review. Benthic macroinvertebrates and periphyton may also be analyzed from select dredge and sediment ponds. Potential sample site locations may be adjusted based on access considerations.

Frequency of Monitoring

Sampling will be conducted annually during the summer for periphyton, benthic macroinvertebrates, and fish.

Monitoring Techniques and Procedures

Procedures will be based on a modification of the Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers (Barbour, et al. 1999). Periphyton and benthic macroinvertebrate samples will be collected from natural substrates. In addition, colonization of artificial substrates such as periphytometers for attached algae, and Hester-Dendy plates or rock baskets for benthic macroinvertebrates will also be utilized. Fish sampling will be conducted with electrofishing equipment and seining.

Reporting

An aquatic ecology report will be prepared that describes the sampling locations, methods and materials used, data analysis, results and conclusions. This report will be submitted to the On-Site Manager. A copy of the results will be presented to the appropriate central and local government offices in an Annual Environmental Report.

3.4 Social, Socioeconometric, and Sociocultural

Potential impacts to land uses, water quality, and archaeological and cultural resources and any conflicts will be monitored. Additionally, drinking water quality will also be monitored.

3.4.1 Drinking Water

3.4.1.1 Parameters to be Monitored

Drinking water quality will meet Mongolian drinking water regulations and World Health Organization (WHO) guidelines for drinking water standards for domestic water consumption. Monitoring will involve collection of water samples and analyzing them for the parameters listed in **Appendix 2**.

3.4.1.2 Sample Site Locations

The drinking water sampling locations will be at the Mine Camp well, where the source of drinking water for the workers will be located.

3.4.1.3 Frequency of Monitoring

Drinking water quality sampling will be conducted once a quarter, unless there is a need for more frequent sampling.

3.4.1.4 Monitoring Techniques and Procedures

Water samples will be collected at the drinking water source. The equipment and methods used will be the same as those used for the analysis of surface water. On-site personnel will be trained to use and maintain the equipment.

3.4.1.5 Reporting

Laboratory results of the water quality analysis will be reported directly to the On-Site ESHS Manager. A copy of the results will be presented to the appropriate central and local government offices in an Annual Environmental Report.

3.4.2 Public Health Protection Plan

3.4.2.1 Parameters to be Monitored

Monitoring will be conducted to see if the following programs are implemented: industrial safety program for operators and employees, employee training programs for safe operation of equipment and education about hazardous materials, and non-employee training programs. All Mongolian regulations regarding public health and safety will be adhered to, particularly as relates to the Law on Environmental Protection.

3.4.2.2 Frequency of Monitoring

Monitoring of the above parameters will be conducted at least annually at all operations.

3.4.2.3 Monitoring Techniques and Procedures

Monitoring will be conducted by a visual inspection of all operations and verbal reports from the general management and on-site managers.

3.4.2.4 Reporting

Monitoring results will be reported to the manager in charge of each operation for corrective measures. A copy of the results will be presented to the appropriate central and local government offices in an Annual Environmental Report.

4.0 Air Quality Management Program

4.1 Preventive and Mitigative Measures

Fugitive dust generated from mining operations is the primary impact to local air quality. Gaseous emissions from mine equipment and vehicles are minor (see details in **Part IV of the SEIA**). The following environmental management measures will be implemented to minimize fugitive dust from the Project:

- Use of haul routes which minimize hauling distances.
- Regular maintenance on mine equipment and vehicles.

- Periodic application of water to the roads and Mine Camp as necessary to reduce dust. Water application to suppress dust from roads will be conducted every three days or as necessary starting from three days after the last rainfall. The source of the water will be from groundwater or from pits. Only actively used Project roads will be treated for dust suppression.
- Reclamation and revegetation of overburden, tailings, pits, and other disturbed areas will be conducted as soon as mine activities in that area are finished, with appropriate grading and contouring of soil material, and potential application of water sprays as necessary. Reclamation and revegetation are covered in detail in the **Mine Reclamation and Closure Plan**.

4.1.1 Equipment Specifications for Preventive Measures

The following equipment will be needed to implement the dust control plan for the Project:

- A water tank truck or equivalent that sprays water on Project roads and Mine Camp areas as needed;
- Water intake pipe on Tuul River, pump system and hose with sprayer to temporarily suppress dust as needed on overburden and tailings piles until the reclamation phase implemented. An alternative to the Tuul River water source would be to use groundwater from the existing well drilled for mine operations or from a new well. The water tank truck could also be equipped with a mobile sprayer;
- A mechanics shop to perform routine maintenance; and
- A minivol air quality sampler.

4.1.2 Operational and Maintenance Procedures

The necessity for implementation of dust control activities will depend on weather conditions (wind, dryness, etc.) in the Project area. Dust suppression will not be necessary during the long winter months due to frozen ground and snow cover. It is anticipated that dust control measures will be implemented as necessary from April to November. Project roads, overburden and tailings piles will be sprayed with water as needed based on visual observations of dust conditions every three days. Minivol air quality samplers will be deployed at various key Project locations to monitor for PM₁₀ and total suspended particulates (see **Section 3.1**) to verify Project compliance with Mongolian and WHO air quality standards. The minivol samplers will act as a check on the effectiveness of dust control measures, and will also verify existing background dust concentrations upwind of Project activities.

5.0 Water Use, Water Quality, and River Channel Management Program

5.1 Water Use

Management of the water supply in the Project area will be an important component in minimizing the probability that water used in placer mine activities will enter the Tuul River or groundwater or that the alluvial aquifer will be severely depleted.

Process water from alluvial mining will be sourced from the dredge ponds. Water supply for the dredge ponds will be from the Tuul River and alluvial aquifer. Occasionally, additional water will be needed to maintain water levels in the dredge pond for operations, especially during the early phases of mining. This water will be pumped from the Tuul River.

Two principal goals of mitigation are zero discharges of process water to the Tuul River and water recycling.

Dredge ponds are isolated from the Tuul River by an embankment that prevents mixing of these waters. Dredge and sediment ponds will be maintained as a zero-discharge, closed circuit system. No surface discharge from mine operations is anticipated.

Recycling of mine process water is a key mitigation measure for Project operations. For dredging operations, wash water is discharged directly back into the dredge pond for reuse with the dredges. The cutter suction dredge will pump overburden as a slurry from the dredge pond to the slurry settling areas. The dredge will pump placer slurry from the dredge pond to the floating wash plants that will separate out the gold and pump the tailings as a slurry to the slurry settling areas initially at start-up, and then later discharge tailings at the back of the dredge pond over the oversized fraction of tailings. Water from the slurry settling areas (containing overburden and tailings) will be recycled back to the dredge pond. Any discharge to the Tuul River will be routed through a sediment pond and routinely monitored.

5.2 Water Quality

The largest sources of potential impacts to surface water and groundwater quality include:

- Surface runoff from disturbed areas such as overburden, tailings, pits, roads and camp;
- Sediment ponds;
- Sewage treatment and disposal; and
- Potential spills of fuel and lubricants.

The Project will incorporate several mitigation measures designed to prevent, or minimize water quality degradation of the Tuul River and the alluvial aquifer from these sources. These management practices are covered in other sections or documents:

- Reclamation and Revegetation (**Mine Reclamation and Closure Plan** document)
- Soil Conservation and Erosion Control (**Section 7.0**)
- Waste Management (**Waste Management Plan** document)
- Accident Prevention, Control and Countermeasures (**Emergency Response Plan** document)

5.3 River Channel Management Program

WMMC is committed to maintain the original characteristics of the river and floodplain. There will be no mining within the river channel nor within the riparian zone. A 100-m buffer zone off the current channel (at least 10 m off the riparian zone) will be maintained.

6.0 Cultural Resource Management Plan

Potential impacts of Project activities include the potential for cultural resource damage throughout the mining area. To mitigate the potential impact on cultural resources, a separate **Cultural Resources Management Plan** will be implemented to identify, preserve and mitigate impacts to prehistoric and historic cultural resources that may be found in the Project area. Avoidance will be the preferred method for mitigation whenever possible. If not feasible, data retrieval will be conducted, for example partial or complete excavation, controlled surface collection, architectural documentation (applicable to some historic sites), instrument mapping, and comprehensive photographic documentation, or some

combination thereof. Removal to a new location may also be feasible for some architectural historic sites.

As part of the **Cultural Resources Management Plan**, specific protocols in case of an unanticipated discovery will be developed for immediate work stoppage in the area of the find, temporary protection and stabilization of the remains, assessment of significance, and if necessary, efficient salvage. The program will include orientation sessions intended to educate mining personnel about the ethics of archaeological and historic preservation, the procedures to be followed in the event of unanticipated discoveries, and preliminary identification of remains that may be exposed when an archaeological monitor is not present.

6.1.1.1 Parameters to be Monitored

For archaeological and cultural resources, the parameter monitored would be the presence of significant archaeological and cultural artifacts in the area that will be disturbed by Project activities.

6.1.1.2 Sample Site Locations

Monitoring of archaeological and cultural resources will be made in the locations where there will be Project-related surface disturbances.

6.1.1.3 Frequency of Monitoring

Monitoring of impacts on archaeological resources will be conducted every quarter, depending upon what activity is occurring at certain points in time. When new areas are ready to be opened for development, the site will be surveyed for resources that may need to be protected such as archaeological remains. Monitoring frequency may be increased as needed.

6.1.1.4 Monitoring Techniques and Procedures

Monitoring for impacts on archaeological resources will be made by surveying the areas within the Project boundaries and close proximity to the Project operations, and interviews with local government agents.

6.1.1.5 Reporting

Documentation that no significant archaeological sites or artifacts will be disturbed prior to exploration or mining in a designated area will be prepared. All results will be reported to the On-Site Manager. A copy of the results will be

presented to the appropriate central and local government offices in an Annual Environmental Report.

7.0 Soil Conservation and Erosion Control Program

Dredging activities will disturb a large amount of soil, which can be eroded and result in sedimentation. Therefore, it is important that soil conservation and erosion control measures are implemented during Project activities. This can be accomplished by reclamation of the dredge spoils, which would stabilize the soil and minimize erosion through revegetation. The reclamation plans are discussed in detail in a separate document, the **Mine Reclamation and Closure Plan**.

8.0 Corporate Social Responsibility

8.1 Public Consultation/Outreach

Public consultation is a method by which the public and stakeholders participate in the impact assessment process. Many countries' regulations now require a public disclosure or public comment period through which stakeholders can participate in the impact assessment process. In Mongolia, Article 16 (2) of the Constitution guarantees the right "to a healthy and safe environment and to be protected against environmental pollution and ecological imbalance" for the citizens of Mongolia. It is the responsibility of citizens to also protect nature and the environment. This aspiration can be accommodated in a public consultation measure.

Disclosure of the SEIA will be done by posting a copy of the document on the OPIC website for 60 days for public review and comment. Feedback from the public will be addressed. It is also planned that a copy of the SEIA document will be placed at Ulaanbaatar and the two soum centers in public domains, such as local libraries. Monthly meetings will be held with the local soum governors to address any issues that may come up. Similarly, quarterly meetings will be held with the aimag governor for the same reason.

Public dissemination of Project information will be done by conducting local community meetings held in the Zaamar and Buregkhangai Soum Centers. The company will interface with officials from the Zaamar and Buregkhangai Soums, and these officials will conduct the interaction with the public. Information to be disseminated will include information on the technology being used for the Project, restricted mining areas, and potential environmental impacts.

Public and social engagements are discussed in detail in a separate document, the **Social Baseline and Stakeholder Engagement Program in the SEIA**.

8.2 Right-to-Know

WMMC believes that the public has a right to know about the types of chemicals that will be used during mining activities. This knowledge will help both employees and local communities protect public health, safety and the environment from chemical hazards. For employees, the information about what hazardous substances are located at their workplace will also help them work with these hazardous substances safely. Therefore, a list of chemicals used will be made available upon reasonable request.

8.3 Community Liaison

WMMC recognizes the importance of an open channel of communication with the surrounding community. To facilitate this, the ESHS Manager will represent the Company in the local community. It is anticipated that this open channel will be able to address issues that come up, and facilitate their resolution.

8.4 Human Impact Mitigation

No impacts on the local populace are expected, as no grazing will be allowed in the Project area. Company employees will be housed at the Mine Camp. No family will be allowed. Employees will work in two shifts for ten days, and then return to Ulaanbaatar by company bus. The Mine Camp will consist of modular housing as well as a field office, warehouse, maintenance shop, etc., and will be located in the northern portion of the Project area. Water is supplied from a drilled well, and food will be supplied by a Mongolian contractor at the Mine Camp.

9.0 Biodiversity Protection Program

9.1 Preventive and Mitigative Measures

Wildlife issues related to the Project cover on-shore and floodplain zones of the Tuul River. Issues include physical disturbance to habitat, noise disturbance to wildlife and settlement disturbance (i.e., poaching and dogs). The following environmental management measures will be implemented to mitigate impacts to wildlife from the Project:

- Monitor and control the speed limit on access routes and the use of unauthorized rogue tracks off established access routes.

- Use of warning signage at known wildlife crossings on access roads.
- Brief workers on the importance of respecting wildlife and minimizing noise and habitat disturbance during the weekly review of the field environmental checklist.
- Prohibit dogs at the Mine Camp.
- Work with the appropriate government agencies to establish the Project area as a "no grazing" conservation area.
- Establish an annual wildlife monitoring program involving international and local biologists to document four key wildlife groups, mammals, birds, fish and "pollution-sensitive" benthic macroinvertebrates, widely known as EPT group invertebrates. Periphyton and algae would also be examined (see **Section 3.0**).
- Strictly prohibit the capturing and hunting of fauna.

The wildlife monitoring program detailed above would contract the independent biologists for the time required to perform the field surveys and report drafts.

For vulnerable and endangered species, a plan for protection and management includes:

- Monitoring of Project activities and possible modification of Project activities to avoid disturbance; and
- Contacting the ESHS Manager to document observations.

9.2 Equipment Specifications for Preventive Measures

For the implementation of the wildlife protection plan, the following equipment will be needed:

- On-site available laboratory space for processing monitoring data from wildlife, vegetation and aquatic ecology field surveys and storing field survey equipment;
- A vehicle and driver for monitoring during daytime and night time field surveys; and
- Equipment for vegetation (tape measurer, quadrat marker, satellite photos) and aquatic biology surveys (net, tray, spatula, periphytometers, Hester-Dendy plates or rock baskets, electrofishing equipment and seines).

9.3 Operational and Maintenance Procedures

A short ESHS briefing and orientation of the Project area will be conducted for visiting wildlife biologists prior to performing fieldwork. Company supervisors will also be advised of the presence and time of visit of the wildlife biologists. Additionally, each wildlife field team will be accompanied by a Company representative during the execution of the field work. WMMC will also provide transportation to and from the Project area for the contractors and food and lodging while on-site.

10.0 Health and Safety Program

Potential impacts related to public health include industrial accidents, drinking water and air quality impacts, waste disposal, fire safety, and noise issues related to Project operations. In addition, operations may directly or indirectly impact domestic and wild animals inhabiting the area surrounding the Project operations. The Company will follow “Good International Industry Procedures” (GIIP).

Mitigation measures recommended to prevent any public health and safety issues include the following:

- Provide an industrial safety program for operators and employees together with a similar and parallel environmental safety requirement that will include the necessity for safe transport and storage of oils and the necessity for excluding livestock from operational areas. The program will be part of the weekly ESHS meetings. New employees will be trained on proper equipment use and emergency response.
- Provide medical personnel, supplies, communications, and vehicle transport for employees in a central location in case of industrial accidents.
- Prohibit the bulk disposal of fecal waste from dwellings and buildings, and promote the use of sanitation systems using biodegradable chemicals or composting toilet technology.
- Require all Mongolian laws including the Mongolian Law on Environmental Protection and the National Program on Biodiversity Conservation be followed with respect to road construction of major arterials and secondary access routes. The construction methods to be used will include the provision of drainage channels to reduce runoff and control erosion. Appropriate dust suppression practices will be used.

- Provide employee training programs for safe operation of equipment and education about hazardous materials in the weekly ESHS meetings.
- Require hard hats and steel-toed boots required in the vicinity of operating machinery.
- Ban smoking near the dredge and within 200 m of fuel and lube storage.
- Ban alcohol while on duty.
- Prohibit the burning or burial of flammable or hazardous waste.

In addition, notification on loss-of-life accidents or other material adverse impacts will be made to the proper authorities.

10.1 Equipment Specifications for Preventive Measures

All required Personal Protective Equipment (PPE) and emergency equipment will be available and utilized when necessary in construction and operation activities. Medical supplies, communications and vehicle transport will be provided in a central location for employees in case of industrial accidents. Sanitation systems, composting toilet technology or a septic tank system will also be provided.

10.2 Operational and Maintenance Procedures

The construction and operation of the Project requires that a health and safety plan be developed early in the Project planning process. Occupational safety requirements, as described in Mongolian regulation, will be complied with during mining operations. Personnel management will also be an important component of occupational health and safety.

The primary objectives of the health and safety plan are to:

- Sponsor and actively participate in a health and safety planning and training program which emphasizes education of the workforce;
- Promote safety such that it receives the highest priority and attention in training;
- Provide adequate PPE to all employees;
- Maintain engineered measures for proper ventilation, in addition to clean and organized working conditions as a first priority for mine management;
- Implement a training program designed to conform to Mongolian regulations; and

- Emphasize the environmental health aspects such as workplace noise, workplace particulates, workplace air quality at key process points, and workplace drinking water.

The Company will follow Mongolian health and safety regulations and international guidelines applicable to the Project.

The Project will meet drinking water standards for domestic water consumption, to ensure that the drinking water will not adversely impact worker health. Drinking water standards will follow WHO Guidelines for Drinking Water Quality for the parameters listed in the Mongolian regulations.

Employees will be trained on the hazards and precautions, and procedures for safe storage, handling, and use of potentially harmful materials relevant to each employee's task and work area. The training will be periodic and supplemented by visual and written information. Training will include routine and emergency safety procedures. Material Safety Data Sheets (MSDS) will be utilized to provide information on chemical properties, safety precautions, storage and other information when appropriate. Basic safety procedures will be taught in all areas.

Employees will be educated in the prevention of accidents and the procedures to follow if an accident does occur. This training will include emergency identification response and notification. In addition, training will be provided to assure all visitors are aware of the health and safety practices employed at the operations. Information will be disseminated to the community regarding possible risks to human and animal health as relates to Project facilities, operations and equipment.

11.0 Security Program

WMMC plans to have its own security by hiring a security officer and putting up a fence around the Project facilities (e.g., the Mine Camp). The Company will actively work with the Chief of Police in the Zaamar and Buregkhangai Soums to train the security force that will be used. The Company plans to have two trained and armed security guards for each shift. A gun permit (if required) will be obtained from the local law enforcement. At the end of each shift, the gold will be collected from the dredge and transported to a secure area.

12.0 References

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APPENDIX 1 Field Reclamation Checklist and ESHS Compliance Assessment

Monitoring of reclamation activities carried out by field teams would follow a field checklist for compliance with ESHS guidelines. Framework for a field inspection checklist would cover the following principal 11 categories including,

1. Mobilization: Construction activities/Camp/Personnel
2. Wastewater management
3. Solid waste management
4. Spill prevention, control and countermeasure plan (SPCC)
5. Erosion control and revegetation plan
6. Air quality and noise control
7. Occupational health and safety
8. Gas and arc welding and cutting
9. Automotive equipment
10. Personnel safety near water bodies
11. General clearing, grading, excavation, trenching and shoring
12. Sensitive areas protection plan (SAPP)

A field checklist presenting a bulleted description of these categories is provided:

1.0 Mobilization: Construction Activities/Camp/Personnel

___ Final design/camps use previously disturbed areas/natural clearings and not sensitive areas?

___ Construction area footprint been minimized and limited to approved construction zones?

___ Vehicle and worker access limited to approved construction zones?

___ Has Contractor provided adequate ESHS training and regular meetings to all workers? Documentation?

___ Contractor established training programs for workers on waste reduction, hazardous waste detection, handling and emergency response; avoidance of unsafe conditions, and regulations applicable to work environment? Documented?

___ Workers who may be exposed to harmful plants or dangerous animals been instructed regarding potential hazards, how to avoid injury, first aid procedures?

___ Workers informed that the following are prohibited?

- ___ disturbance to native fauna/sensitive habitat except as allowed by permits/Environmental Management Plan
- ___ collect flora or fauna; hunting or fishing
- ___ harvest fruits, vegetables or grain
- ___ keep pets/domestic animals

- collect/disturb archaeological remains/sites; report sites to ESHS Manager.
- Have all workers been informed about illegal drug and alcohol policies?
- Minimization of helicopter/vehicle trips
- Have all workers been instructed to keep to a minimum social contacts with local inhabitants? No trade or bartering permitted.
- River crossings constructed perpendicular to water flow with flow obstructions avoided?
- Temporary fences used for all security fences (fuel depots, etc.)?

2.0 Wastewater Management

- Sewage system (black water) of proper design and location for treatment and disposal?
 - septic tank and leachfield system?
 - if not, then treatment plant of adequate size for sewage treatment utilized that includes chlorination with weekly test for TRC and monthly test of total and fecal coliforms?
- Is sanitary waste treatment at work camps in compliance with Mongolian laws?
- Provisional latrines minimum 1 m depth and maintained with periodic lime and soil layer additions and vector/wildlife access controls?
- Is sewage system location a minimum of 15 m from living quarters, 100 m from nearest surface water and 180 m from nearest potable well?
- Is grey water channeled through a grease trap to a septic system or infiltration pit?

3.0 Solid Waste Management

- Non-biodegradable wastes (plastic, glass, metals) collected and reused or sent to recycling centers?
- Used oils, greases and lubricants collected and recycled (local recycling capability?) or incinerated?
- Medical wastes collected in a designated container and incinerated?
- Biodegradable food residues being landfilled or given to local farmers for livestock consumption?
- Source reduction plan prepared and waste minimization practiced?
- Waste pit/landfills constructed properly (location, depth, vector control) and daily operations procedures followed?
- Maintenance operations performed only at the base camp?
- Waste Management Coordinator assigned with daily waste mgmt. activity logs kept and weekly summary reports provided to ESHS Manager?
- Identification and segregation of non-hazardous and hazardous wastes?
- Site-specific Waste Management Plan prepared and implemented for each facility?

- ___ Solid waste receptacles located throughout Mine Camp and storage yards?
- ___ Solid waste and hazardous waste transportation guidelines implemented and permits received?
- ___ Solid waste management activities and closure performed in a technical, legal, sanitary and environmentally acceptable manner and guaranteed in writing by Contractor?
- ___ Hazardous waste properly collected, inventoried, labeled, stored and contained? Waste transport manifest kept and sent to the Environment Ministry/Regulators and ESHS Manager within 7 days?
- ___ Final disposition of hazardous waste at authorized hazardous waste facilities or recycling centers?
- ___ Waste oil properly stored?
- ___ Used batteries stored in an enclosed facility and sent to a recycling facility?
- ___ Oily rags collected and incinerated?
- ___ Hazardous waste drum inspections
- ___ MSDS provided to workers and maintained on file?

4.0 Spill Prevention, Control and Countermeasure Plan

- ___ SPCC Plan been prepared by Contractor?
- ___ Within SPCC Plan, has a Spill Emergency Response Measures Plan, Spill Incident Response Procedures Plan, Spill Incident Report system been developed and implemented?
- ___ Copies of SPCC Plan maintained at all facilities and provided to key personnel/organizations?
- ___ Spill cleanup materials/tools kept near the facilities/tanks and readily available?
- ___ Adequate supply of spill control equipment on hand at each facility (earth moving equipment, absorbent materials, shovels, rakes, pumps, empty drums and absorbent booms?)
- ___ Plot plan prepared for each facility of drainage patterns/ loading and unloading facilities by Contractor?
- ___ Are fuel/oil storage tank installation constructed such that secondary containment with impervious surface is provided for the entire contents of largest single tank, plus sufficient freeboard to allow for precipitation?
- ___ Drainage from diked storage areas restrained by manual open/close valves or other acceptable means?
- ___ Drums and fuel tanks stored at Mine Camp located in covered areas with impermeable dikes?
- ___ Spills, leaks, and precipitation in secondary containment areas properly managed/cleaned-up?
- ___ Have all spills been properly contained, cleaned-up and collected in 55 gallon drums for off-site disposal?
- ___ Refueling/lubrication operations performed a minimum of 15 m from water with mitigation measures/equipment (drip pans, absorbent pads, etc.) on-hand?

- Contractor prepared list of type, quantity and storage location of containment and clean-up equipment to be used during construction?
- Routine (daily) inspections performed on loading and unloading areas and storage tanks with records kept?
- Fire detection systems and extinguishers available at facilities?
- Emergency response communication equipment readily available (min. 2-way radios and horns)
- First-aid equipment located in every building and all trucks?
- Is all equipment, including emergency equipment/fire extinguishers routinely inspected, maintained and documented?
- Contractor made all necessary arrangements with local hospitals, clinics, police, fire departments and emergency response teams?
- Routine spill prevention training provided?
- Are all facilities surrounded by a wire fence with controlled access and tri-lingual no-trespassing signs posted? Plot plan prepared of locations of fences and gates?
- Amendments to SPCC Plan provided?

5.0 Erosion Control and Revegetation Plan

- Topsoil conserved and separated from other soil layers in a well-distributed manner?
- Soil stability measures implemented as soon as possible where work is temporarily or permanently halted?
- Barriers which might have been cut and left as gaps during the construction will be repaired to the original conditions prior to the construction activity?
- Proper erosion control techniques implemented as natural conditions dictate?
- Mulching
- Brush Cuttings
- Crushed Gravel/Stone
- Ditch Plugging
- Filtration Fabric Fences
- Terraces/Water bars
- Erosion Control Fabrics
- Sediment Ponds
- Vegetation will be reestablished through natural seeding and regeneration.
- Vegetation plugs of willow utilized in sensitive environmental areas such as the riparian areas adjacent to the Tuul River?
- Agreement in place with land owners prior to restoration of rangeland?

6.0 Air Quality and Noise Control

___ Dust control measures implemented in Project area (water applied when necessary and available)?

___ Workers safeguarded from inhalation, ingestion, skin absorption, or contact with gases, vapors, fumes, dusts or mists at concentrations above safe levels?

___ Face masks provided to workers when dust from construction activities becomes an annoyance or health hazard?

___ Engines, generators, etc. properly maintained to maximize combustion efficiencies and minimize emissions of contaminants?

___ Noise control measures in place to control unsafe noise levels?

___ Appropriate hearing protection provided to workers exposed to excessive noise that cannot be controlled by engineering or administrative controls?

___ Exposure to impulsive or impact noise kept below the 140 dB peak sound pressure level?

7.0 Occupational Health and Safety

___ Contractor maintaining a list of all hospitals and health posts in the vicinity of the Project area that can provide minor injury and emergency health care for workers, and rank facilities based on type of care provided?

___ Does hospital list include contact numbers, addresses, location map, specialties, helicopter emergency services, if available?

___ Contractor provided staffing, supplying and maintenance of a small medical facility at Mine Camp?

___ Helicopter arrangements secured for Project in event of a life-threatening worker emergency requiring immediate hospitalization?

___ Contractor provided all workers health care vaccinations, condoms on request, etc.?

___ Contractor developed a detailed Safety Plan?

___ Safety Policy established for employees, contractors and the general public been established?

___ Have all employees been advised of their responsibilities and is their performance being regularly measured?

___ Are the following addressed by managers/supervisors and employees adhering to the following:

___ plan work to minimize personal injury, property damage, loss of productivity

___ maintain system for review and correction of procedures, practices and unsafe conditions

___ make available and enforce PPE and mechanical guards where needed

___ provide appropriate tools and provide effective inspection and maintenance program

___ investigate all accidents to determine cause and take prompt corrective actions

- hold and document regular safety and environmental meetings
- communicate and enforce rules and safety standards
- Incident reports and injury and illness records being maintained?
- Has Safety Inspector and First Aid Attendant been assigned?
- Are workers adhering to the following PPE requirements where required: safety shoes, hard hats, eye protection, hearing protection, safety harness, respirators, welder's helmet? Respirator use training provided?
- Monthly inspections of Contractor equipment, including PPE, hand tools, ladders, scaffolds, etc?
- Fire protection equipment provided and tested monthly?
- Have names and telephone numbers of Contractor and Subcontractor Supervisors been provided to Company's on-site representative for posting in Company's office?
- Contractor maintaining a log of recordable occupational injuries and illnesses and supplemental records of each, and publishing an annual summary of results?
- First Aid Kits - provided on supply trucks of construction crew with qualified person in charge of kit
- First Aid Kit contents periodically checked for completeness and made with material approved by physician in weatherproof container with individual sealed packages?
- Accident reporting- injured employee(s) immediately reporting injuries to foreman, and foreman reporting all accidents in an accident report to field office?
- Contractor developed and implemented an emergency plan for major medical emergencies?
- Good housekeeping practices implemented?
- Adequate supply of potable water been provided in all work areas?
- Portable water container hygiene followed?
- Does lighting meet minimum illumination intensities in construction areas, shops, offices and storage areas?
- Exhaust systems designed such that dusts, fumes, mists, vapors or gases are not drawn through the work area of employees? Is system operating continuously?
- Contractor developed an effective fire protection and prevention program that ensures availability of fire protection equipment and suppression equipment required?
- Is access to firefighting equipment maintained at all times and is equipment conspicuously located, periodically inspected and maintained?
- Trained and equipped Fire Brigade assigned?
- Are fire extinguishers rated a minimum of 20 ABC provided within 15 m of wherever more than 25 liters of flammable or combustible liquids or 3 kg of flammable gas are being used on the job site?
- Is at least one portable fire extinguisher having a rating of not less than 20 ABC units located not less than 8 meters, nor more than 24 m from any flammable liquid storage area located outside?

___ Is 20 ABC fire extinguisher rating located on tank trucks transporting flammable liquids?

___ Is electrical wiring and equipment for light, heat or power purposes being installed in compliance with applicable country codes?

___ Are “No Smoking” or “Unauthorized Ignition Sources” signs conspicuously posted at or in the vicinity of operations that constitute a fire hazard?

___ Are only approved containers and portable tanks used for storage and handling of flammable and combustible liquids?

___ Are the following criteria being met in Open Storage areas: driveways min 5 m wide around combustible storage piles, no combustible material stored outdoors within 3 m of a building, portable fire extinguishers rated not less than 2A shall be placed no more than 30 m away

___ Are the following indoor storage area criteria met: all materials stored according to their fire characteristics, non-compatible materials that may create a fire hazard shall be segregated by a barrier having a fire resistance of at least 1 hour, storage shall not obstruct exit?

___ Project area access road criteria:

___ No open fires nor cooking allowed on the steppe grassland

___ Fire extinguishers to be carried on all vehicles

___ Refueling of equipment to be performed with engines shut off?

___ Construction areas been posted with visible and legible traffic signs at points of hazards?

___ Are flaggers provided with and wearing a red or orange warning garment while flagging?

___ Night workers required to wear warning garments with reflecting material?

8.0 Gas and Arc Welding and Cutting

___ Transportation and storage of gas cylinders:

___ valve protection caps in place

___ gas cylinders secured and transported in an upright position at all times except when hoisting or carrying cylinders for short time periods

___ oxygen cylinders in storage are separated from fuel gas cylinders or combustible materials a minimum distance of 6 m or by a non-combustible barrier at least 1.5 m high with fire-resistance rating of at least one-half hour

___ Contractor thoroughly instructed personnel in the safe use of fuel gas?

___ Contractors instructed personnel in the safe means of arc welding and cutting as follows:

___ PPE including eye protective equipment for welding and cutting, buffing or grinding work

___ hearing protective equipment when welding in a bellhole

9.0 Automotive Equipment

___ Contractors ensuring that the use of any motor vehicle equipment having an obstructed view to the rear is not allowed unless the vehicle has a reverse signal alarm or an observer signals that it is safe to back the vehicle up.

___ Vehicles used to transport personnel equipped with seats that are firmly secure and adequate for the number of employees to be carried?

___ Seat belts installed on all equipment (except for equipment which is designed for stand-up operation or for equipment which does not have ROPS or adequate canopy protection) and being used?

___ Only qualified personnel been assigned as operators?

___ Proper regard for safety of employees and public shown by Contractor?

___ Equipment inspected daily and maintained in good working condition with inspection reports provided to the supervisor?

___ Have all bi-directional machines (rollers, compactors, front-end loaders, bulldozers and similar equipment, been equipped with a working horn which shall be operated as needed when the machine is moving?

___ Are the following criteria being met with regard to backhoes, bulldozers, or tow tractors?

___ controls are properly set and machine guards and safety devices kept in position and properly maintained

___ machine operator responsible for machine maintenance and safety

___ cleaning rocks, roots, or dirt from buckets on digging wheel or conveyor shall not be done while machine is in motion

___ cables and fastenings to be checked daily on digging wheel and conveyors and brakes shall be checked before operating machine on inclines

___ operator shall demand and ensure that all employees or public stand in the clear of the machine (i.e., conveyor as well as the digging wheel) prior to machine operation

___ employees shall stand clear of skids or timbers placed under the ditcher tracks

___ all steps, tracks or any surface used to mount the rig shall be clean, dry, free of grease, oil, mud or dirt

___ bulldozers equipped with headache racks or protective cover constructed of material sufficiently strong to protect operator when they are used in clearing operations

___ operator shall never attempt to make any repairs or adjustments or grease machine without first disengaging clutch and shutting machine down

___ cribbing shall be provided if necessary to work under the bulldozer blade

___ no one shall give signals, directions or other instructions to an equipment operator unless they have been trained, authorized and directed to do so

___ fuel handling shall never be handled in open containers and safety cans shall be used when handling small quantities

- ___ vehicle/equipment, maintenance, repairs and servicing shall be performed in a safe place removed from traffic and out of work area unless proper barricades have been set up to provide a safe working area
- ___ No work shall be performed on any machines or equipment until and unless the equipment has been shut down and locked out, brakes set, and all blades, buckets, etc. have been lowered completely to the ground or properly blocked.

10.0 Personnel Safety near Water Bodies [if applicable]

- ___ Life jackets/buoyant work vests provided to employees working over or near water?
- ___ Ring buoys with minimum 25 m of line available for emergency rescue?
- ___ Distance between ring buoys no more than 60 m?
- ___ Is at least one lifesaving skiff available where employees are working over or adjacent to water?

11.0 General Clearing, Grading, Excavation, Trenching and Shoring

- ___ If warranted, prior to starting an excavation, an underground installation check of sewer, telephone, water, pipelines, etc. shall be performed?
- ___ Daily inspections of excavations, adjacent areas, and protective systems being made by competent person for hazardous conditions?
- ___ Protective measures taken for banks > 1.5 m high to ensure stability?

12.0 Sensitive Areas Protection Plan

___ SAPP for the adjacent rangeland, especially on east side of Tuul River and steep slopes

___ Reduction of number of people and equipment as much as possible in these environments

___ Camp, staging areas, storage areas and access routes avoid sensitive areas

___ Waste materials hauled away to appropriate landfill

___ Strict protection provided for T&E species

___ Would settlement or natural resource extraction be detected, authorities shall be contacted immediately

___ Access restricted to construction site and its facilities

13.0 NGO Interface - Documentation

14.0 Government Interface - Documentation

15.0 Contractor/Owner Interface - Documentation

APPENDIX 2 Tables

Table 1. Permitted Levels of Pollution (Mongolian regulation)

Pollutant	Permitted Level	
	Daily maximum	Daily mean
CO (mg/m ³)	8	3
SO ₂ (µg/m ³)	500	30
NO ₂ (µg/m ³)	85	40
Particulates (µg/m ³)	500	150

Table 2. WHO Ambient Air Quality Guidelines

Parameter	Averaging Period	Guideline Value (µg/m ³)
Particulate Matter (PM) _{2.5}	annual mean	10
	24-hour mean	25
PM ₁₀	annual mean	20
	24-hour mean	50
Ozone (O ₃)	8-hour mean	100
Nitrogen dioxide (NO ₂)	annual mean	40
	1-hour mean	200
Sulfur dioxide (SO ₂)	24-hour mean	20
	10-minute mean	500

PM: particulate matter

Noise prevention and control measures will be implemented when Project noise levels exceed the noise level guidelines (**Table 3**, **Table 4**, and **Table 5**) at the most sensitive point of reception. Project noise should not result in a maximum increase of three decibels (dBs) at the nearest receptor off-site. Sound level meters (Type 1 or 2) should log data at least hourly for as much as 48 hours, and be located about 1.5 meters above the ground surface and three meters from any reflecting surface.

Table 3. IFC General EHS Noise Guidelines

Receptor	One-Hour LAeq (dBA)	
	Day (07:00 to 22:00)	Night (22:00 to 07:00)
Residential, institutional, educational	55	45
Industrial, commercial	70	70

Table 4. WHO Noise Level Guidelines

Specific Environment	LAeq (dBA) ^a	Time Base (hours)	LAmx fast (dBA) ^b
Indoor dwelling and school class room	30 to 35	variable	variable
Outdoor living area	50 to 55	16	--
Industrial, commercial shopping and traffic areas, indoors and outdoors	70	24	110

Source: WHO, 1999

^a LAeq (dBA) = long-term A-weighted sound pressure level equivalent

^b LAmx fast (dBA) = maximum A-weighted sound pressure level at the “fast” meter setting

Table 5. IFC General EHS Noise Limits for Various Working Environments

Location/Activity	Eight-Hour LAeq (dBA)	LAmx fast (dBA)
Heavy industry (no need for oral communication)	85	110
Light industry (decreasing need for oral communication)	50 to 65	110
Open offices, control rooms, service counters, or similar	45 to 50	--
Individual offices (no noise disturbance)	40 to 45	--
Classrooms, lecture halls	35 to 40	--
Hospitals	30 to 35	40

Workers should utilize hearing protection capable of reducing sound levels at the ear to at least 85 dBA when:

- exposed to a sound pressure level above 85 dBA more than eight hours per day;
- exposed to an instantaneous peak sound pressure level of more than 140 C-weighted sound pressure level (dBC); and

- the average maximum sound pressure level is equal to or more than 110 dBA.

Large equipment should be equipped with a soundproof cab. Workers exposed to high noise levels should have periodic hearing assessments.

Workplace air quality and noise must not impact employees' health, and protective measures must be taken in situations where the limits exceed the threshold limit values or might affect workers' health. Guidelines for work in confined spaces, hazardous material handling and storage, general health, general safety, training and record keeping and reporting are also included.

Workers should utilize hearing protection capable of reducing sound levels at the ear to at least 85 dBA when:

- exposed to a sound pressure level above 85 dBA more than eight hours per day;
- exposed to an instantaneous peak sound pressure level of more than 140 C-weighted sound pressure level (dBC); and
- the average maximum sound pressure level is equal to or more than 110 dBA.

Large equipment should be equipped with a soundproof cab. Workers exposed to high noise levels should have periodic hearing assessments.

Table 6. Surface Water Treatment Standard

Parameters	Standard	Units
Turbidity	20	milligrams per liter (mg/L)
Color	35	degree
Odor (at 20° and 60°C)	2	point
Oxidation potential	3	mg O ₂ /L
Manganese	0.1	mg/L
BOD	3	mg O ₂ /L
Iron	1.0	mg/L
pH	6.5 to 8.5	
Phytoplankton	1.0	mg/L
Amount of lactose positive bacilli in one liter of water	1,000	

Source: Mongolian State Standard MNS 0900-1992, Water Quality Class I

Guidelines are provided for liquid effluent discharged into receiving waters from tailings impoundments, mine drainage, sedimentation basins, sewage systems and stormwater drainage. These include limits for pH, 5 day Biological Oxygen Demand (BOD), oil and grease, Total Suspended Solids (TSS) and temperature at the end of the mixing zone. Residual heavy metal and cyanide target guidelines

are also provided, below which no significant impacts on aquatic biota or human use is expected. Note that this Project will not use chemicals (i.e., cyanide or mercury) to separate the gold from the placer sands and gravels.

Table 7. IFC EHS Mining Effluent Guidelines

Parameter ¹	Guideline Value
TSS	50 mg/L
pH	6 to 9 standard units
Chemical oxygen demand	150 mg/L
Five-day BOD	50 mg/L
Oil and grease	10 mg/L
Arsenic	0.1 mg/L
Cadmium	0.05 mg/L
Chromium, hexavalent	0.1 mg/L
Copper	0.3 mg/L
Cyanide	1 mg/L
Cyanide free	0.1 mg/L
Cyanide WAD	0.5 mg/L
Iron	2.0 mg/L
Lead	0.2 mg/L
Mercury	0.002 mg/L
Nickel	0.5 mg/L
Phenols	0.5 mg/L
Zinc	0.5 mg/L
Temperature ²	< 3 degrees Celsius (°C) differential

¹ Metal concentrations represent total metals.

² Effluent temperature should not result in an increase of more than 3 °C of the ambient temperature at the edge of the scientifically established mixing zone which accounts for ambient water quality, receiving water use, and assimilative capacity among other considerations.

Table 8. Classification of Surface Water Quality

No.	Classification parameters	Unit	1 very clean	2 clean	3 less polluted	4 polluted	5 more polluted
A. Oxygen parameters							
1	Dissolved oxygen	m/g	9<	8	6	4	<4
Tests on samples taken during nights or before 9 AM are to be disregarded							
2	Oxygen saturation	percent	90<	75	60	40	<40
3	BOD	mg O ₂ /L	<3	5	10	15	15<
4	Chemical Oxygen Demand	mg O ₂ /L	<10	15	25	50	70<
5	Oxidation potential	mg O ₂ /L	<3	5	10	20	30<
6	Hydrogen Sulfide (H ₂ S)	mg O ₂ /L	No appearance		0.1	1	1.0<
B. Minerals content parameters							
7	Total hardness	H ^a	<10	15	20	30	40<
8	Calcium ion	mg/L	<45	90	150	200	300<
9	Magnesium ion	mg/L	<15	30	50	100	200<
10	Total Dissolved Solids	mg/L	<200	300	500	800	1200<
11	Chloride ion	mg/L	<50	150	250	350	500<
12	Sulfate ion	mg/L	<50	100	300	300	400<
C. Nutrient parameters							
13	Ammonia (NH ₄ ⁻)	mg/L	<0.02	0.05	0.1	0.3	0.5<
14	Nitrite (NO ₂ ⁻)	mg/L	<0.002	0.005	0.02	0.05	0.1<
15	Nitrate (NO ₃ ⁻)	mg/L	<1	3	5	10	20.0<
16	Organic nitrogen	mg/L	<0.3	0.5	1	2	2.0<
D. Other parameters							
17	Hydrogen indicator, pH		6.5-8.0	6.5-8.5	6.0-8.5	6.0-9.0	5.5-9.5
18	Total Iron (Fe ²⁺ , Fe ³⁺)	mg/L	<0.3	0.5	1	1.5	1.5<
19	Manganese (Mn ²⁺)	mg/L	<0.05	0.1	0.3	0.8	1.5<
20	Phenol	mg/L	Absent	0.001	0.002	0.005	0.01<
21	Phosphates (PO ₄ ³⁻)	mg/L	<0.02	0.05	0.1	0.5	0.5<
22	Total phosphorous (PO ₄ ³⁻)	mg/L	<0.025	0.1	1	2	2.0<
23	Surface active agents	mg/L	Absent	<0.1	0.5	1	1.0<
24	Petroleum, its products	mg/L	Absent	<0.05	0.1	0.3	0.5< ^a
25	Fat	presence	Absent			None floating on surface	
E. Physical Characteristics							
26	Smell, taste		No foul odor, taste		Detectible by experts	Obvious foul odor and taste	
27	Color	quality	No color	No color	Slightly colored	Noticeable color	Noticeable color
28	Brightness	cm	35<	30	25	20	<20
29	Suspended matters ^b	mg/L	10<	20	50	100	100<
F. Bacteriological parameters							
30	E. coli titration		>10	1	0.1	0.01	<0.01
31	Disease triggering bacteria		Must not be present				
32	Total microbe amount		<5 x10 ³	104	3x10 ⁶	5x10 ⁶	5x10 ⁶ <
G. Toxic Substances							
33	Cyanide ion (CN ⁻)	mg/L	Not present		<0.01	0.05	0.1<
34	Mercury (Hg ²⁺)	mg/L	Not present		0.001	0.005	0.005<

No.	Classification parameters	Unit	1 very clean	2 clean	3 less polluted	4 polluted	5 more polluted	
35	Arsenic (As ³⁺ , As ²⁺)	mg/L	absent	0.01	0.02	0.05	0.05<	
36	Fluorine (F)	mg/L	0.2	0.5	1	1.5	1.5<	
Only for agricultural use								
37	Boron (B)	mg/L	Must be absent		0.5	1	<1.0	
38	Selenium (Se ²⁺)	mg/L	Absent	0.01<	0.05	0.1	<0.1	
39	Zinc (Zn ²⁺)	mg/L	<0.2	1	2	5	5.0<	
40	Vanadium (V)	mg/L	Must not be present			<1.0	1.0<	
41	Copper (Cu ²⁺)	mg/L	<0.01	0.05	0.1	0.5	0.5<	
42	Cadmium (Cd ²⁺)	mg/L	Absent	0.005	0.01	0.1	0.1<	
43	Cobalt (Co ²⁺)	mg/L	<0.01	0.02	0.05	0.1	1.0<	
44	Molybdenum (Mo ²⁺)	mg/L	<0.001	0.1	0.5	1	1.0<	
45	Silver (Ag ⁺)	mg/L	<0.001	0.01	0.02	0.05	0.05<	
46	Nickel (Ni ²⁺)	mg/L	<0.01	0.05	0.1	0.2	0.2<	
47	Sulfate ion	mg/L	Must not be present					
48	Lead (Pb ²⁺)	mg/L	<0.01	0.05	0.1	0.2	0.2<	
49	Chromium (Cr ³⁺)	mg/L	Absent	0.1	0.2	0.5	0.5<	
50	Chromium (Cr ⁶⁺)	mg/L	Absent	0.01	0.05	0.1	0.1<	
51	Free Chlorine (Cl)	mg/L	0	0	0	0.1	0.5<	
H. Saprobe quality								
52	Pantle-Buke index		<1.0	1.5	2	2.5	2.5<	
53	Sladchek classification		Xeno, X	Oligo, O	Oligo-beta-meso, (o-β-m)	Alpha-meso, α - m	Poly, P	

Source: 3rd Attachment to the Joint Directive of MNE and the Ministry of Health, No. 143/a/352 of 1997

Notes: a = Must not be found when the most precise chemical analysis is done.

b = Only applies during low flow.

Natural acidic, mineralized and hardened water does not fit in this surface water classification.

The Tuul River in the Project area is classified as Class 2.

Table 9. Maximum Allowable Concentration of Chemical Substances in Drinking Water (Mongolian regulation)*

Parameters	Maximum Allowable Concentration ^a
pH	6.5-8.5
Turbidity	1.5
Total hardness	7.0
Chloride	350
Dry residue	1000
Phenol compounds	0.002
Phosphate ions	3.5
Nitrates	10.0
Polyacrylamides, residue	2.0
Sulfate	500
Fluoride	0.7-1.5
Molybdenum	0.25
Beryllium	0.0002
Cadmium	0.01
Silver	0.05
Selenium	0.001
Strontium	2.0
Lead	0.03
Total Chromium	0.05
Aluminum	0.5
Arsenic	0.05
Copper	1.0
Calcium ion	100
Magnesium ion	30
Manganese	0.1
Total iron (Fe ²⁺ , Fe ³⁺)	0.3
Zinc	5.0
Cyanide	0.01

^aAll units are mg/L except pH (standard units), and hardness (meq/L)

*Attachment to the Directive a/11/05/A/18 of Minister of Infrastructure, Minister of Health, and Minister of Nature and Environment, 1997 and Mongolian State Standard 3900-86

For comparative purposes, WHO drinking water guidelines are presented here. Parameters were selected based upon the parameters listed in the Mongolian drinking water regulations.

Table 10. Selected Drinking Water Guidelines from the World Health Organization

Parameter	Value	Notes
pH	-	low pH: corrosion; high pH: taste, soapy feel; preferably <8.0 for effective disinfection with chlorine
Turbidity	5 NTU	nephelometric turbidity units (NTUs); appearance
	0.1 NTU	effective disinfection
Total hardness	100-300 mg/L	high hardness: scale deposition, scum formation; low hardness: possible corrosion
Total dissolved solids	1,200 mg/L	taste
Ammonia	1.5 mg/L	odor
	35 mg/L	taste
Sodium	200 mg/L	taste
Chloride	250 mg/L	taste, corrosion
Nitrates	50mg/L	acute
Nitrite	3 mg/L	acute
	0.2 mg/L	chronic
Sulfate	250 mg/L	taste, corrosion
Hydrogen sulfide	0.05-0.1 mg/L	odor and taste
Cyanide	0.07 mg/L	
Fluoride	1.5 mg/L	
Color	15 TCU	true color units (TCUs); appearance
Taste and odor	-	not observable
Temperature	-	cooler
Aluminum	0.2 mg/L	depositions, discoloration
Antimony	20 µg/L	
Arsenic	0.01 mg/L	
Barium	0.7 mg/L	
Boron	0.5 mg/L	
Cadmium	0.003 mg/L	
Chromium	0.05 mg/L	(total)
Copper	2 mg/L	
Lead	10 µg/L	
Iron	0.3 mg/L	staining of laundry and sanitary ware
Manganese	0.4 mg/L	
Mercury (total)	0.006 mg/L	(inorganic)
Molybdenum	0.07 mg/L	
Nickel	70 µg/L	
Selenium	0.01 mg/L	
Silver	0.1 mg/L	
Uranium	0.015 mg/L	
Zinc	3 mg/L	appearance, taste

In addition, all water directly intended for drinking must not have E. coli or thermotolerant coliform bacteria detected in any 100-milliliter sample.

Cultural Resources Management Plan

Social and Environmental Monitoring and Management Program

Big Bend Placer Gold Mining Project



Prepared for:



Prepared by



October 2008

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1.0 Introduction

As part of the Social and Environmental Impact Assessment process, WMMC will implement a comprehensive cultural resources management plan to identify, preserve, and mitigate impacts to prehistoric and historic cultural resources. The program is in conformance with World Bank Operational Policy (OP) 4.11, and specifically provisions of Operational Policy Note (OPN) 11.03 on Management of Cultural Property in Bank-Financed Projects (as reproduced in the OP 4.11 document). World Bank procedures were the basis of the Equator Principles in regard to management of threatened cultural resources. OPN 11.03 considers cultural properties as “both remains left by previous human inhabitants (for example, middens, shrines, and battlegrounds) and unique natural environmental features such as canyons and waterfalls.” In general, World Bank policy emphasizes the preservation and avoidance of cultural properties. Proper management of cultural resources over the course of the Big Bend Gold Project will include: consultation with professionals and others who have an interest in the Project, background research, intensive inventory and site assessment, mitigation of impacts to threatened sites, monitoring and dealing with unanticipated discoveries, data analysis and reporting, and providing for curation of artifacts and other remains. It is anticipated that the cultural resources program will be conducted under the immediate direction of the Institute of Archaeology/Mongolian Academy of Sciences, with Project oversight by AATA International and WMMC.

2.0 Comprehensive Cultural Resources Management Plan

The comprehensive cultural resources management plan is the guiding document for all phases of the cultural resources program. The plan will set forth in a detailed and sequential manner the steps to be taken in order for WMMC to be in full conformance with cultural resources requirements. The plan will be driven by a schedule that provides adequate time for Project planning, site identification and assessment, and mitigation prior to the commencement of mining activities. Incorporated into the plan will be a research design that integrates the various activities to be conducted in the course of site identification, assessment, and mitigation. The research design will provide a theoretical context for the proposed investigations based on the current state of archaeological and historical knowledge in the Project area. It will include (a) Project description and statement of objectives, (b) description of previous investigations in the region including known and anticipated cultural property types, (c) theoretical underpinnings of the research, and (d) field and laboratory methodologies to be used in execution of the design.

Specific activities to be conducted under the terms of the comprehensive management plan include:

1. Consultation: It is imperative that the cultural resources program be undertaken in full view of all persons and institutions having a stake or interest in the Project. Prior to the onset of research activities, the Project team shall consult with professional archaeologists and historians having knowledge of the area. Local residents and users of the Project area shall be contacted as well for information about known sites. Finally, concerns of local government representatives and NGOs (non-government organizations) about Project impacts to sites will be solicited.
2. Intensive Field Inventory and Site Assessment: The inventory phase of the Project includes not only a pedestrian survey of affected areas but also assessment of the significance of individual recorded properties. The criteria for significance assessment will be established based on the consultation process in concert with established procedures of the Institute of Archaeology.
3. Mitigation of Impacts: Mitigation measures will be established and implemented before mining operations start within the impacted areas.
4. Monitoring: Depends on the scale and significance of the sites, archaeological monitoring may be required within some or all impacted areas during mining operations.
5. Data Analysis, Reporting and Curation: Detailed procedures for data analysis and report shall be defined and implemented. Recovered artifacts and non-artifactual remains will be repositied properly.

Consultation, background research, intensive field inventory and site assessments at the Big Bend Project Site were conducted in July 2008 by the AATA Project team, which included a one-week site visit as well as in-door data evaluation and compilation. Details of the findings are presented in the SEIA report. The rest of the activities to be conducted under the terms of the cultural resources management plan are described in the following subsections.

2.1 Mitigation of Impacts

The preferred form of mitigation will always be avoidance because it guarantees the continued existence of a site. Given the nature of the proposed undertaking, however, avoidance is not likely to be feasible in all cases. Significant properties that occur within impact areas, and for which avoidance is not possible, will be subjected to some form of data retrieval that accounts for the nature of the site as well as the nature of the projected impact (total vs. partial). Options for data

retrieval include partial or complete excavation, controlled surface collection, architectural documentation (applicable to some historic sites), instrument mapping, and comprehensive photographic documentation, or some combination thereof. Removal to a new location may also be feasible in the case of certain architectural historic sites. Data retrieval will occur within the theoretical context provided by the Project research design and will be conducted according to procedures detailed in that document.

2.2 Monitoring and Unanticipated Discoveries

With the exception of sites that will be mitigated according to national guidelines, archaeological monitoring of surface-disturbing activities near the sites will be implemented to ensure their preservation. The extent to which monitoring is necessary will be dependent upon the types and depositional contexts of sites recorded during the inventory phase, in combination with geomorphological data about the likelihood of specific sediments and soil units to produce subsurface archaeological materials. The comprehensive management plan will include specific protocols, in the event of an unanticipated discovery, for immediate work stoppage in the area of the find, temporary protection and stabilization of the remains, assessment of significance and, if necessary, efficient salvage. The monitoring program will include orientation sessions intended to educate mining personnel about the ethics of archaeological and historic preservation, the procedures to be followed in the event of unanticipated discoveries, and preliminary identification of remains that may be exposed when an archaeological monitor is not present.

2.3 Data Analysis and Reporting

Analysis of field data derived from both survey and excavation will be undertaken according to the dictates of the Project research design. A comprehensive report of investigations will be produced in a timely fashion following completion of mitigation procedures and data analysis. The report will consist minimally of the following elements:

- Introduction: Project Description and Administrative Information;
- Environmental Overview and Geomorphological Setting;
- Prehistoric and Historic Contexts;
- Results of Background Research;
- Project Research Design;
- Field and Laboratory Methods;
- Inventory Results: Site Descriptions and Assessments;
- Description of Excavations [and other data retrieval activities, as appropriate];

- Artifact Analysis;
- Data Syntheses and Archaeological Summary;
- Management Recommendations;
- Project Summary and Conclusions; and
- Bibliography.

The report will be amply illustrated with Project and site CAD maps; photographs including Project overviews, individual site views, in-progress views of data retrieval activities, and cultural features; and line drawings and/or photographs of artifacts. Supplementary materials will include completed site inventory record forms with accompanying maps and photographs, and databases generated in the course of artifact analysis.

One or more separate reports detailing the results of monitoring and/or salvage of unanticipated discoveries may be required. Given the multi-year schedule of the proposed Big Bend Gold Project, it is realistic to assume that discoveries will be made following completion of the comprehensive cultural resource report. One such site has been identified, photographed, and located recently during site reconnaissance and review activities associated with the drilling program.

2.4 Curation

Artifacts and non-artifactual remains obtained in the course of survey and excavation activities will be repositied permanently at the Mongolian Institute of Archaeology or in a regional facility approved by the Institute. All field notes will be preserved with the collections. Artifacts will be catalogued into the established system of the Institute of Archaeology, and a final curation database will be generated to facilitate efficient access to the materials. All materials will be maintained under climate-controlled conditions that ensure preservation in perpetuity. Sites will be maintained and protected and the Institute of History (Archaeology), Mongolian Academy of Sciences, WMMC and AATA International, Inc. will decide jointly whether to excavate, study, restore, preserve and/or otherwise protect such areas from vandals.

Occupational Health and Safety Plan

Social and Environmental Management and Monitoring Program

Big Bend Placer Gold Mining Project



Prepared for



Prepared by



October 2008

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List of Abbreviations and Acronyms

ANSI	American National Standards Institute
COO	Chief Operating Officer
ERP	Emergency Response Plan
ESHS	Environmental, Social, Health and Safety
GFCI	ground fault circuit interrupter
HazCom	Hazard Communication
JHA	Job Hazard Analysis
km	kilometers
LEL	lower explosive limits
LTA	Lost-Time Accident
MLL	Mongolian Labor Law
MSDS	material safety data sheets
NIOSH	National Institute for Occupational Safety and Health
OHSP	Occupational Health and Safety Plan
PFD	personal flotation devices
PPE	personal protective equipment
Project	Big Bend Placer Gold Mining Project
SEMMP	Social and Environmental Monitoring and Monitoring Program
US	United States
WHMIS	Workplace Hazardous Materials Information System

1.0 Introduction

1.1 General

The Occupational Health and Safety Plan (OHSP) summarizes the occupational health and safety procedures that will be implemented during the operational phases of the Big Bend Placer Gold Mining Project (Project).

The Project OHSP will be used in conjunction with the prevailing Mongolian legislation. The contents of this manual are not inclusive of all applicable Mongolian Aimag, Soum and Municipality rules and regulations; therefore, all Project personnel and Contractors are expected to be familiar with any applicable statutory requirements not specifically referenced herein.

In case of conflict between the requirements of this manual and the Mongolian governing legislation, the most stringent will govern.

This Plan has been developed to complement, not replace, each individual Contractor's OHSP, and all related policies and procedures. This Plan will take precedence in case of conflict.

1.2 Scope

The Project is located in northern central Mongolia in the Zaamar Goldfield region within the Tuul River Valley approximately 225 kilometers (km) northwest of the capital city Ulaanbaatar. The project will consist of several activities including construction of a mining camp, placer gold mining, processing, and reclamation, and a drilling program.

The mine camp will consist of a field headquarters including a field office, a warehouse, a repair shop and a communications center, septic system, on-site waste incinerator, groundwater well and other infrastructure, and modular housing accommodations for up to 65 people.

The placer gold deposits within the Project area are contained in the alluvial deposits below the groundwater level. WM Mining Company, LLC (WMMC) intends to develop the Project placer gold deposits by employing modern efficient dredging technology. WMMC will employ alluvial (wet) mining techniques using a complete Dutch IHC double dredging system to mine the placer gold deposits. The system will include two cutter suction dredges, a floating wash plant, a minimum of 1,100 meters of floating steel and rubber pipeline. The two dredges will operate in a dredge pond; one dredge will primarily be responsible for removing overburden; and one dredge will be responsible for mining the placer

gold deposits. The operation will employ concurrent and continuous reclamation so that only the active mining area will be open and un-reclaimed. Bulldozers, frontend loaders, and dump trucks will be used to strip and stockpile the topsoil prior to the construction of the dredge pond.

All dredges and the floating process plant are diesel powered units; and, a small diesel generator will be used to power local camp operations. Solar (photovoltaic) and wind power may be used for local lighting and other purposes as may be developed. Diesel fuel for the project will be provided by local suppliers from Ulaanbaatar. The fuel will be transported to the mine site by tanker trucks. A depot center consisting of diesel fuel storage tanks and associated facilities will be constructed.

In addition to the mining WMMC will conduct drilling operations at the Project site. Two drilling rigs will be employed for infill drilling and for confirmation drilling as well as exploration drilling.

The WMMC Project Team is committed to a healthy and safe working environment. The success of the OHSP depends on its successful implementation on every level by all Project personnel. Experience shows that sound accident prevention techniques and principles result in a healthy, safe, and productive workplace. To ensure the realization of this objective, the OHSP is established to provide awareness and participation by all persons (WMMC/Contractors) on the Project.

This plan is applicable to all personnel working at the Project site whether they are employed by: WMMC, Ikh Tokhoirol XXX (a Mongolian limited liability company wholly owned by WMMC), a Contractor, a Subcontractor or any other person engaged in the Project.

Prior to the commencement of any work, all Project personnel will review and understand the contents of this OHSP. The proper implementation of this OHSP will promote occupational health and safety compliance as well as provide a consistent approach to achieving injury/incident-free performance by all parties throughout the life of the Project.

Personnel working at the site will be responsible for the implementation of safe work practices and ensuring that their work activities do not result in hazards to themselves or to others.

WMMC will provide a site medical clinic with registered medically trained personnel.

1.3 Occupational Health and Safety Objectives

The overall goal of the OHSP will be achieved by adopting policies of accident/incident prevention as follows:

- Minimization of unsafe conditions. Accidents are caused by unsafe physical conditions of equipment or mechanical exposure to the working environment;
- Minimization of unsafe acts by providing competent supervision to ensure workers use proper techniques and methods;
- Taking advantage of every opportunity to correct unsafe acts or conditions before an injury occurs; and
- Implementing procedures to prevent any abuse via filing of false claims of injury or illness.
- Training of personnel in safety.
- Promulgating a culture of safety at the site.

The following are the established Project OHS objectives to which all Project personnel will subscribe and strive to achieve:

- No fatalities;
- Zero lost time incidents (injuries and work-related illnesses);
- Minimal medical treatments and first aid cases;
- No spills or releases/impacts to the natural environment; and
- Continual reduction of incidents which could lead to any of the above.

All Project personnel are to be routinely audited on their knowledge and subsequent performance level of the Project OHSP by the Environmental, Social, Health and Safety (ESHS) Manager. The audit will indicate the need for additional upgrading, if required, throughout the Project life.

Each person is responsible for their own safety and the safety of co-workers by following safe work procedures, and by reporting sub-standard safety acts and conditions to their immediate supervisor. Every worker has the right to refuse to perform work that they consider is unsafe. No penalties will be applied for refusing to work in unsafe conditions. Workers will also be encouraged to report unsafe working conditions and attitudes if observed.

1.4 Worker Responsibilities

All personnel including contractors and subcontractors working at the Project area at any time during the life of the Project will be required to comply with the OHSP.

The following are contractor responsibilities:

- In all cases, Contractors will be required to ensure that all its employees, and the employees of any sub-contractor under its control, fully understand and comply with all the requirements of the OHSP;
- Contractors will be responsible for advising all its personnel and sub-contractors of the Project's OHS goals, policies, requirements and procedures during the orientation sessions. This will be a mandatory precedent before any person commences employment at the Project, facility, site or office location. The Project safety orientation will provide the general safety requirements and the presenter will ensure proper understanding of the presented safety materials; and
- WMMC and a Contractor's management personnel will promote, assist, and participate in safety meetings, audits and reporting to reinforce the importance of OHS on the Project.

2.0 Organization and Responsibilities

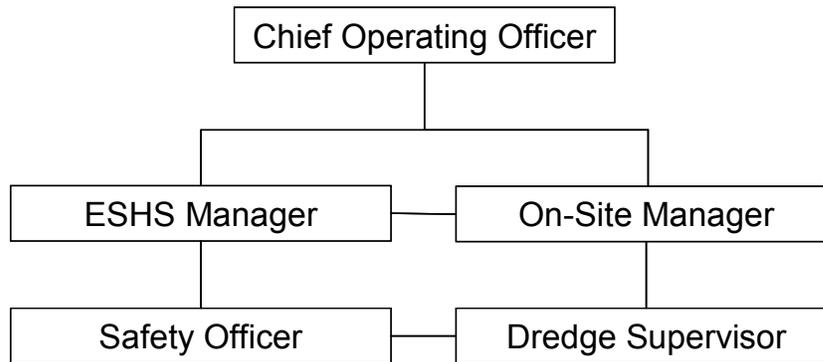
2.1 Organization

Implementation of the Project within Mongolia will be undertaken by WMMC.

2.2 OHS Roles and Responsibilities

The Organization structure for the Project is shown on **Figure 1**. The OHS roles and responsibilities are defined below.

Figure 1 Occupational Health and Safety Organization



2.2.1 Chief Operating Officer

The Chief Operating Officer (COO) will oversee the overall Project activities. This position will be located in Ulaanbaatar. The COO will be ultimately responsible for emergency preparation and ensuring that the response plan is in place and ready to be implemented. The COO will be directly involved in permitting and compliance, as well as social and environmental management.

2.2.2 On-Site Manager

The On-Site Manager will oversee all of the operations at the Project site. This person will be responsible for ensuring that the Mine Camp and mess hall operations are run well, that the Mine Camp is properly supplied, and that diesel fuel and lube are adequate for mine operations. This person will supervise the activities of the Mine Camp and workshop staff as well as oversee the tasks of the security officers and the ESHS Manager. The On-Site Manager will supervise all mining operations in the field. The On-Site Manager will be responsible for ensuring that the appropriate Emergency Response Plan is implemented for incidents at the Project area. The On-Site Manager will report to the COO in Ulaanbaatar and coordinate with the Office Manager in Ulaanbaatar for day-to-day operations. During emergencies, this person will be the primary coordinator at the Project site.

2.2.3 Environmental, Social, Health and Safety Manager

According to Chapter 1, Article 93 of the Mongolian Labor Law (MLL), a business enterprise or organization will have an appointed employee and a council consisting of employer's and workers' representatives in charge of OHS issues. This employee will be the full-time ESHS Manager. The ESHS Manager will be

on-site to coordinate environmental activities and to oversee health and safety issues and ensure that the OHSP is implemented.

The specific roles and responsibilities of the ESHS Manager are as follows:

- Ensure that all mining operations are in compliance with all prevailing regulations and requirements for this Project, including environmental and social requirements;
- Maintain knowledge of international and Mongolian governing legislation, codes and practices, and ensure that revisions to the Project OHSP are made as required;
- Ensure sufficient medical/emergency supplies and transportation are available to respond to any emergency, and assist the On-Site Manager in implementing the Emergency Response Plan during emergencies;
- Conduct investigations, or ensure an investigation is conducted, and reviews all incidents, such as accidents, incidents, spills, health exposures, disabling injuries, and fatalities, and produce investigation reports for circulation to the required authorities;
- Ensure that all personnel employed on the Project are adequately trained and knowledgeable in the application of the applicable ESHS regulations;
- Maintain a co-operative working relationship with the community and regulatory officials;
- Represent the Company in the local community to address any social issues that come up, and facilitate their resolution;
- Prepare and file all ESHS reports related to the Project as required by Mongolian legislation, and immediately transmit copies of such reports to the applicable persons;
- Maintain current and up-to-date OHS records, reports, and files in a secure area, including those required by responsible Mongolian regulatory agencies. Copies of these documents relative to the construction phase will be retained by WMMC;
- Monitor and report on compliance with the Project OHSP by all Contractors and their personnel at the site;
- Ensure that Contractors supply (where necessary), maintain, operate and locates all safety, first aid, medical and firefighting equipment in accordance with Mongolian legislated requirements;
- Ensure that the contractor and subcontractors attend the daily toolbox safety meetings;
- Ensure that all Contractor's personnel have completed the health and safety orientation session prior to commencement of work activities on-site, including a minimum of eight hours of specific safety training;
- Provide a supply of safety and personal protective equipment (PPE) for WMMC personnel, and ensure that it is properly utilized and maintained;
- Maintain any safety performance records required by corporate safety recognition and rewards programs that may be established, and arrange the appropriate ceremonies to recognize the achievements;

- Conduct Job Hazard Analysis (JHA), where appropriate;
- Conduct and/or review daily site OHS inspection and reporting. Monitor as appropriate;
- Issue “stop work” instructions when OHS conditions require such action;
- Initiate site-specific OHS reports as required; and
- When applicable, monitor all aspects of traffic safety concerning staging, detours, illumination, signals, and temporary signs/road markings. Maintain communications with relevant authorities.

2.2.4 Dredge Supervisor

The Dredge Supervisor will oversee all dredging and processing operations in the field. This person will be assisted by a geologist to ensure that dredging operations will run smoothly and effectively. The overall direction of field operations will be coordinated with the Chief Geologist. The first person on the scene of an accident will contact the Dredge Supervisor and the Safety Officer (defined below) to report the incident. The Dredge Supervisor will then implement the appropriate response and report to the ESHS Manager and the On-Site Manager.

2.2.5 Safety Officer

One person at each dredge and floating process plant will be the Safety Officer, who will be responsible for all safety issues during that shift. The individual Safety Officers will work with the ESHS Manager to ensure that all health and safety requirements are met. The Safety Officer will be responsible for ensuring that the Emergency Response Plan is implemented at the assigned dredge.

3.0 Orientation, Meeting and Communications

3.1 General

The following procedures apply to the Project when WMMC employees and contractors are engaged in daily operational and maintenance activities.

3.2 Site Orientation

The WMMC ESHS Manager is responsible for ensuring all their personnel are familiar with and able to implement the OHSP. All personnel are required to attend and complete the Site Orientation Session prior to conducting any work

activities on-site. The orientation sessions will discuss a number of topics (e.g., environment) in addition to OHS.

This Site Orientation is a prerequisite to entering the Project area to work, except for those persons entering the site as a Visitor (Visitors must be accompanied by a designated, orientated Project person, and will abide by the Project OHS regulations).

Workers who have completed the Site Orientation Session will be given an identification card which will be retained by the employee and will be produced on demand while on the work site.

The OHS portion of the orientation session will include a review of the following:

- OHS relationship and interactions of WMMC, Ikh Tokhoirol XXX;
- Safe Work Procedures;
- Project security provisions;
- Emergency Response Plan, including muster points, location of telephones/radios for emergency use, and transportation coordinates;
- General site layout including location of First Aid / medical facilities and sanitary facilities;
- Work site hazard awareness (this will also be conducted on a site location basis);
- Proper PPE and use thereof;
- Vehicle/equipment operation and safety;
- All permit-required work; and
- Camp and construction site rules and regulations.

This orientation will be conducted in the morning, or as required, and workers will be allowed to proceed to their work area following the session. In no event will any worker commence work prior to having completed the Project Site Orientation. All personnel who attend the Project Site Orientation Session will be required to sign an attendance sheet, and will be issued with a copy of the WMMC OHSP. Copies of attendance sheets will be filed and stored in a secure location in the OHS office.

3.3 Tool Box and Pre-job Safety Meetings

A "tool box" meeting is a short meeting held by each supervisor at the start of each shift to discuss with their crew the work of the day including special procedures, any potential hazards, all safety issues relating to the work, and any other issues or concerns of these personnel. Required daily "tool box" meetings

will be recorded in bullet format and an attendance record signed by all present. Weekly summaries of these “tool box” meetings will be submitted to the ESHS Manager.

Where a critical task is planned, a pre-job meeting will also be convened. Attendance will be limited to the crew conducting the task, their immediate supervisor(s), and associated safety representatives, as required. A JSA will be initiated, reviewed and then presented to the crew before each critical task begins. Weekly summaries of these JHAs will be submitted to the ESHS Manager.

The ESHS Manager will be advised of all scheduled meetings, and may attend, if deemed appropriate. All copies of Contractor's minutes and attendance records are to be provided to the ESHS Manager.

3.4 Weekly Occupational Health and Safety Meetings

Weekly meetings will be convened to review all OHS related matters. The ESHS Manager will prepare the agenda, with input from attendees. Attendees will include the:

- ESHS Manager;
- WMMC On-Site Manager; and
- Contractor's On-Site Representative(s).

3.5 Occupational Health and Safety Investigations and Incident Reporting

All OHS incidents will be investigated and reported for the following purposes:

- To meet the requirements of the Mongolian regulations;
- To ensure that workers affected receive the benefits to which they are entitled; and
- To provide information that may be useful in preventing similar occurrences from reoccurring either at the Project area or elsewhere.

The ESHS Manager will keep copies of all reports on file for at least the duration of the Project.

3.5.1 Responsibilities

Completion of field OHS reports and records are the responsibility of the ESHS Manager and/or the worker involved in the incident. The following reporting

procedures are mandatory to ensure a uniform method of reporting and recording the occurrence of accidents at the Project area.

- Verbal notification will occur as soon as possible. The ESHS Manager will provide, within two (2) hours, a written preliminary description of the incident/accident;
- Field reports and records will be completed promptly after each incident or accident. Each reportable Medical Aid, lost time incident and property damage/loss will require the completion of an WMMC Accident/Incident Investigation Report;
- Workers' Compensation reports by the ESHS Manager and the affected person will be filed as stipulated in the applicable Mongolian regulations;
- Copies of all preliminary investigation reports will be sent to the ESHS Manager within 24 hours of the occurrence, and a final report within seven (7) days. The ESHS Manager will then issue a complete report for fatalities, critical injuries or lost time injuries, to the COO and On-Site Manager.
- The ESHS Manager will create, distribute and explain a one-page "lessons learned" document of all incidents/accidents (including pictures, if possible) to all field supervisors within 24 hours. The worker's supervisors will communicate the lessons learned information to all their personnel in a timely manner. A copy of the "lessons learned" document will be submitted to the COO and On-Site Manager; and
- For all fatalities, lost time injuries or critical injuries, the ESHS Manager must be notified immediately.

3.5.2 Occupational Health and Safety Reporting/Incident

3.5.2.1 Definitions

- i) **Fatality:** A fatality is a death of a worker on the Project or at the workplace resulting directly from an occupational illness or occupational injury. All fatalities will be classed in a separate category on the accident statistics (zero severity).
- ii) **Critical Injury:** A critical injury is one of a serious nature that:
 - Places life in jeopardy;
 - Produces unconsciousness;
 - Results in substantial loss of blood;
 - Involves the fracture of a leg or arm but not a finger or toe;
 - Involves the amputation of a leg, arm, hand or foot but not a finger or toe;
 - Consists of burns to a major portion of the body; or,

- Causes the loss of sight in an eye.
- iii) Occupational Injury: An occupational injury results from a work-related accident or exposure on the Project or at the workplace.
- iv) Occupational Illness: An occupational illness results from an exposure to a chemical or physical agent on the Project or at the workplace that causes illness that requires first aid or medical aid treatment.
- v) First Aid Case: Any one-time treatment and subsequent observation of minor scratches, cuts, burns, splinters and so forth. This treatment is considered first aid even though not provided by a physician or registered medical professional personnel. First aid cases include:
- Using of non-prescription medication at non-prescription strength;
 - Using of wound coverings such as bandages, band-aids, gauze pads, butterfly bandages or steri-strips;
 - Using of any non-rigid means of support such as elastic bandages, tensor wrap, non-rigid back belts, etc.;
 - Using of eye patches;
 - Removing foreign bodies not embedded in the eye using only irrigation or cotton swab;
 - Removing foreign bodies from a wound, if the procedure is uncomplicated (e.g., by irrigation, tweezers, or other simple technique);
 - Using of temporary immobilization devices (e.g., slings, neck collars, back boards), while transporting the injured;
 - Cleaning, flushing or soaking wounds on the surface of the skin;
 - Applying hot or cold therapy (compresses, gel packs, soaking, whirlpools);
 - Using massage (physiotherapy or chiropractic treatment is medical aid);
 - Drilling fingernail or toenail to relieve pressure or draining a fluid blister;
 - Using finger guards;
 - Using negative X-ray diagnosis;
 - Drinking fluids for relief of heat stress;
 - Administering a tetanus shot(s) or booster(s); and
 - Preventatively administering oxygen or intravenous fluid in absence of symptoms.
- vi) Medical Aid Treatment Case: A medical aid case is any occupational injury/illness that involves neither lost workdays nor restricted workdays but which requires treatment by a physician or licensed health care professional at the physician's office or at a clinic or a hospital. The following are generally considered to be medical treatment:
- Use of prescription medication or prescription antiseptics;
 - Medical treatment of second- or third-degree burns;
 - Application of sutures, staples or surgical glue/tape to close wound;

- Removal of foreign bodies embedded in the eye;
 - Removal of foreign bodies from a wound, if the procedure requires excision or cutting the outer layer of skin;
 - Cutting away of dead skin (surgical debridement);
 - Reparation of broken or chipped teeth; and
 - Treatment of injuries that result in loss of consciousness, regardless of treatment, even if the individual resumes work after regaining consciousness.
- vii) **Lost-time Injury:** A lost-time injury is an occupational injury or illness which renders the affected worker unable to report for work the day following the injury.
- viii) **Lost-time Day(s):** Lost-time day(s) is/are the day(s) counted as a result of the injured worker being rendered unable to work the day following an injury. For example, if an employee were injured at work on a Monday, off of work the following two days - Tuesday and Wednesday - and returned to work on Thursday, the same week, this would constitute a 2-day lost-time injury.
- All lost work days and restricted days associated with a lost-time case are assigned to the calendar year and month in which the accident occurred. Reasonable estimates may be made as a final record to close out fiscal year statistics.
 - If a case involves medical treatment or loss of work days prior to termination or layoff, then the case and days are entered appropriately as a medical aid or lost-time injury. The recording of days against the case stops as of the date of termination or layoff, even though the employee may not be released for full duty.
- ix) **Restricted (Modified) Work Cases:** A restricted work injury is an occupational injury or illness where the worker returns to work and conducts a task that is within his post accident physical capacity. Restricted work cases are classified as medical aid cases.
- x) **Reporting Standards:** Any incident which has the potential to cause serious injury. Fatalities will be classified in a separate category, which will not be included in the injury severity calculations.
- xi) **Lost-Time Injury Frequency Rate:** Is calculated by multiplying the number of Lost-Time Injuries by 200,000 and dividing that result by the number of work hours expended during the time period of the report.

$$\text{Lost-Time Injury Frequency Rate} = \frac{\text{Number of Lost-Time Injuries} \times 200,000}{\text{Number of Hours Worked}}$$

- xii) **Injury Frequency Rate:** Is calculated by multiplying the number of Lost-Time Incidents and Medical Aids by 200,000 and dividing that result by the number of work hours expended during the time period of the report.

$$\text{Injury Frequency Rate} = \frac{\text{Number of Lost-Time Incidents and Medical Aids} \times 200,000}{\text{Number of Hours Worked}}$$

- xiii) **Injury Severity Rate:** Is calculated by multiplying the total number of work days lost to injury and illness by 200,000 and dividing that result by the number of work hours expended during the time period of the report.

$$\text{Injury Severity Rate} = \frac{\text{Number of Work Days Lost to Injury and Illness} \times 200,000}{\text{Number of Hours Worked}}$$

A First Aid and Medical Aid Log is to be maintained by WMMC for all treatments administered to site personnel for on-site and off-site treatment, respectively.

3.5.3 Occupational Health and Safety Reporting

Examples of accidents or injuries that must be reported include:

- An injury or accident that results in death;
- An injury or accident that results in a “critical injury”- i.e., one of a serious nature that:
 - Places life in jeopardy,
 - Results in unconsciousness,
 - Results in substantial loss of blood,
 - Involves the fracture of a leg or arm,
 - Involves amputation of a leg, arm, hand or foot,
 - Consists of burns to a major portion of the body, or
 - Causes the loss of sight in an eye;
- An unplanned or uncontrolled explosion, fire or flood that causes a serious injury or that has the potential of causing a serious injury;
- The collapse or upset of a crane, derrick or hoist;
- The failure of any component of a dredge or structure necessary for the structural integrity of the dredge; and
- Any environmental incident above/beyond the legislatively established threshold.

If there are additional reporting requirements with respect to other categories of incidents, and/or inclusion of prescribed information and/or a Professional Engineer's report, then such prescribed reporting will continue to remain the responsibility of the Party (e.g., WMMC/Contractor) involved.

3.5.4 Reporting an Initial Occurrence (First Aid)

Any occurrence of injury or illness reported to a First Aid Station, to supervision or to the Medical Clinic will be recorded in detail in the First Aid Treatment Log. Entries in the logbook will be by the Medical Aid Attendant, or the ESHS Manager and the information will be kept confidential..

3.5.5 Reporting Medical Aid

Any occurrence that becomes a Medical Aid Case will be recorded on a Medical Aid Treatment Log and a copy will be provided to the WMMC ESHS Manager.

All personnel are required to promptly advise the ESHS Manager of the occurrence of a Medical Aid Case.

In addition to being recorded in the Medical Aid Treatment Log, the Medical Aid Case will be investigated by WMMC, and the ESHS Manager will complete an Accident Investigation Report.

3.5.6 Reporting a Lost Time Accident

When an employee experiences an injury or work-related illness, the employee has the right to be examined by a qualified medical doctor. Should the employee choose not to be examined, the Medical Aid Attendant may, if it is felt to be necessary, insist such an examination to be performed.

In the event the medical doctor determines the employee should take time off of work, in addition to the day after the accident occurred, the accident becomes a Lost-Time Accident (LTA). LTAs require the completion of at least the following forms:

- Preliminary Incident Report to be issued within four (4) hours;
- The appropriate Worker's Compensation Form(s) completed by the medical doctor promptly following the examination, diagnosis, referral, and/or treatment of the worker; and
- The Employer's Report of Accident and Illness (within 24 hours of the LTA occurrence) completed and filed by the ESHS Manager. A copy of this report will be filed with Mongolian authorities as required.

All LTAs will be reported by the ESHS Manager to senior WMMC management. LTAs will be recorded on the LTA Report that is submitted on a monthly basis to WMMC.

3.6 Monthly Statistics Reporting

3.6.1 Contractor Reporting

Each month (no later than the 2nd working day of the following month), the Contractor will submit to the ESHS Manager a Contractor's Monthly Safety Report detailing LTAs, Medical Aids, First Aids, near misses, lost work days, man-hours worked, and mobile equipment incidents.

3.6.2 WMMC Occupational Health and Safety Reporting

Following receipt of the safety statistics from the Contractor, the ESHS Manager will compile the Monthly Safety Statistics Summary, and submit it to the COO and On-Site Manager by the 3rd working day of the following month. Details of all LTAs, Medical Aids, First Aids, near misses, lost work days, man-hours worked, and mobile equipment incidents will be attached, as well as steps that were taken to prevent further recurrences.

Additionally, minutes of all OHS meetings and inspections, a summary of all significant safety achievements and individual Contractor statistics reports will be attached.

3.7 Occupational Health and Safety Communications/ Bulletin Board

In order to promote OHS, and to maintain a highly visible OHS profile at the Project area, WMMC will establish OHS bulletin boards of a size suitable to accommodate OHS notices, the Emergency Response Plan (ERP) and phone numbers, minutes of Project OHS meetings, and any other pertinent OHS information. The ESHS Manager will be responsible for keeping all postings current and up-to-date.

3.8 Inspections

WMMC will perform frequent safety and housekeeping inspections (formal and informal) of personnel work and storage areas.

Personnel will be advised of any infraction and/or potentially unsafe condition, and will take corrective action immediately, where possible. If immediate corrective action is not possible, the hazard(s) will be properly barricaded and identified as "unsafe" until proper corrective action is taken.

The ESHS Manager will follow-up on all infractions to ensure that corrective action is taken promptly. The ESHS Manager will formally advise personnel if prompt action is not taken to rectify any unsafe condition. Failure to rectify any unsafe condition may result in work stoppage or other disciplinary action against the worker.

4.0 Employee Code of Conduct

The following list of unacceptable conduct will apply to the Project. Any violation of these, as well as any other rules, policies or procedures, is prohibited and may lead to termination of employment, banning from all Project facilities or other disciplinary measures:

- Intimidation or discrimination of any kind;
- Harassment (sexual or otherwise);
- Assault, physical, emotional or otherwise;
- Horseplay, practical jokes;
- Gambling;
- Theft, which includes “stealing of time” from the employer;
- Sleeping while on-duty;
- Possession of or being under the influence of alcohol or drugs (**Section 5.0**);
- Conveyance or use of firearms and offensive weapons of any kind;
- Smoking outside of designated, approved areas; and
- Non-compliance, by vehicle operators, with:
 - All traffic signs,
 - All speed limits,
 - Wearing seat belts, and
 - Safe and hazard-free vehicle operation at all times;
- The improper use or lack of use of designated sanitary facilities; and
- The use of radios or headphone-type players at the construction site (they may hinder one's ability to hear emergency alarms, and may be a source of ignition.).

5.0 Drug and Alcohol Abuse Policy and Procedures

WMMC is committed to providing a healthy, safe and secure work environment for the Project. Therefore, the illegal use, sale, purchase, transfer, possession or presence in an employee's system of drugs, other than medically prescribed drugs, while on-site is prohibited. The use, sale, transfer or possession of alcoholic beverages by personnel while on-site, except as named and specifically authorized by WMMC, is also prohibited. Successful implementation of this Policy requires an equal commitment on the part of all Project personnel (WMMC/Contractor) to accept responsibility for their own safety and the safety of others. Contractors will be required to take all reasonable steps to ensure that all their personnel comply with this Policy and will be responsible for the implementation and enforcement of its own alcohol and drug policies consistent with this Policy.

The commitment of all personnel to OHS can only be measured by their conduct and performance on the job. By necessity, given the nature of the Project's location and/or the safety risks at the construction site, all personnel will also have regard for their individual conduct or behavior off the job that may adversely affect their ability to safely perform their duties at work. This specifically extends to the consumption or use of alcohol and drugs, and physical contact with other employees of any nature.

5.1 Drug and Alcohol Abuse Standards

All personnel will abide by applicable laws and government regulations ruling the possession or use of alcohol and drugs. It is the responsibility of all persons in managerial/supervisory roles (including Contractors) to be aware of all applicable legislation and any changes that may affect this Policy.

- It is the responsibility of each person to be capable of working in full possession of his/her faculties.
- No employee will report to work, or be at work, with a measurable level of alcohol in the blood, urine, or saliva. This means consumption of less than 100 grams of liquor in the previous 24 hours as assumed by a blood alcohol level in excess of 0.05 percent.
- No person will report to work, or be at work, with any drug in his/her body, other than that which has been medically prescribed for an employee's particular use.
- No person will distribute, possess, consume, use or be under the influence of alcohol or drugs, or consume abusively any prescription or over-the-counter medication that affects his/her mental or physical faculties on any lands or premises, or in any vehicle or other equipment owned by WMMC.

- Notwithstanding these general standards, where a more stringent alcohol and drugs policy or procedures exist by means of a governing authority, all personnel are required to comply with such policy or procedures.
- The use, sale, purchase, transfer or possession of alcoholic beverages by employees is prohibited within the Project area, except as namely and specifically authorized by WMMC.

5.2 Breach of Drug and Alcohol Abuse Policy

A breach of any of the above standards, by any person, will be considered a breach of this Policy and will result in disciplinary action up to and including dismissal. Dismissal will occur at the first offense.

It is the responsibility of all Project personnel to be concerned about alcohol and drug use in the workplace. If supervisors, in their judgment, feel that an employee is in breach of this Policy, they are expected to take immediate action in consultation with the ESHS Manager.

5.3 Compliance through Education

WMMC recognizes the importance of making Contractors and all employees aware of the actual and potential risks, both on and off the job, related to the consumption or use of alcohol or drugs. Education and awareness will be the principal method of ensuring commitment to and compliance with this Policy, and in reducing workplace health and safety concerns associated with non-compliance issues.

All Project personnel will receive an information package on the impacts of alcohol and drugs on a person's health during the site orientation.

All Project supervisors (including Contractor's supervisors) will be educated on monitoring and identification of behavior and performance problems that may be linked to the use of alcohol or drugs.

5.4 Compliance through Alcohol and Drug Testing

To further ensure a safe work environment and compliance with this Policy, WMMC may also request that specific (as opposed to random) alcohol and drug testing be conducted in the following circumstances:

Reasonable Grounds: When WMMC believes, on reasonable grounds, that an employee's ability to safely and satisfactorily perform his/her job duties is

impaired, the employee will be required to submit to an alcohol and drug test (below).

Accident or Other Incident: When any Project personnel are involved in an accident, a near miss or other potentially dangerous incident, and if there are reasonable grounds to believe that the employee's consumption of alcohol or drugs was a factor in the occurrence of such an accident or incident, the employee will be required to submit to an alcohol and drug test immediately following the accident or incident, or as soon as it is practical under the circumstances.

For greater clarity and by way of example only, "reasonable grounds" include:

- Specifically, a situation where the smell of alcohol is detected on an employee's breath at work;
- A person's eyes are dilated from the influence of a consumed substance;
- Sexual conduct between employees will not be condoned under any circumstances. If there is any information concerning this act, the employee will be dismissed without any further consideration for cause without recourse.
- Generally, a situation where an employee is acting in a suspicious or unusual manner or where an employee has been unable to correct a chronic performance or behavior problem at work, which gives rise to a reasonable suspicion on the part of the employee's supervisor that the employee may have consumed or used alcohol or drugs at work or may be under the influence of alcohol or drugs, and which suspicion cannot be dispelled by the employee, when confronted, to the satisfaction of the supervisor.

Reasonable Cause Checklist

Date: _____

Employee: _____ Duty: _____

Check the phrases that best describe this employee's behavior. Provide as much information as possible that may assist in clarifying the situation, as well as any witnesses to the behavior described.

Phrases	Date(s)	Comments
General Appearance <ul style="list-style-type: none"> <input type="checkbox"/> Sleepy <input type="checkbox"/> Tremors <input type="checkbox"/> Bloodshot or rheumy eyes <input type="checkbox"/> Unkempt appearance, hygiene <input type="checkbox"/> Other (specify) _____ 		
Workplace Behavior <ul style="list-style-type: none"> <input type="checkbox"/> Interrupts other workers <input type="checkbox"/> Inflexible about procedures <input type="checkbox"/> Argumentative <input type="checkbox"/> Inappropriate emotional outbursts <input type="checkbox"/> Physically threatening <input type="checkbox"/> Alcohol or drug consumption observed 		
Temperament at Work <ul style="list-style-type: none"> <input type="checkbox"/> Withdrawn much more than usual <input type="checkbox"/> Easily upset by everyday events <input type="checkbox"/> Agitated and on edge <input type="checkbox"/> Excessively worried or fearful <input type="checkbox"/> Extreme variations of mood 		
Job Performance <ul style="list-style-type: none"> <input type="checkbox"/> Forgets instructions, normal procedures <input type="checkbox"/> Works abnormally slow <input type="checkbox"/> Erratic productivity <input type="checkbox"/> Missed deadlines <input type="checkbox"/> Signs of intoxication (smell of alcohol or drugs, slurred speech, confusion) <input type="checkbox"/> Poor judgment <input type="checkbox"/> Fails to wear safety equipment <input type="checkbox"/> Other (specify) _____ 		

Phrases	Date(s)	Comments
Relationship with Co-workers <ul style="list-style-type: none"> <input type="checkbox"/> Abnormal reaction to criticism <input type="checkbox"/> Imagines criticism where there is none <input type="checkbox"/> Complaint received from co-worker <input type="checkbox"/> Complaint from client 		
Absenteeism <ul style="list-style-type: none"> <input type="checkbox"/> Excessive absence <input type="checkbox"/> Unlikely excuses for absence <input type="checkbox"/> Excuse for absence proven false <input type="checkbox"/> Absences follow a pattern <input type="checkbox"/> Frequently late returning from breaks <input type="checkbox"/> Excessive absence from workstation 		
Circumstances of an Accident <ul style="list-style-type: none"> <input type="checkbox"/> No apparent reason for the event 		
Further Observations or Comments:		
Investigating Supervisor (print)		
Signature:		Date:
"One-Up" Supervisor (print)		
Signature:		Date:
Manager (or designate) (print)		
Signature:		Date:
Reasonable cause for alcohol and/or drug testing exists Yes <input type="checkbox"/> No <input type="checkbox"/>		

* **Reasonable Grounds:** Includes information established by the direct observation of the employee's conduct or other indicators, such as the physical appearance of the employee, his/her attendance record, circumstances surrounding an accident, near-miss or potentially dangerous incident and the presence of alcohol, drugs or drug paraphernalia in the vicinity of the employee or where the employee worked.

* **Circumstances Surrounding an Accident:**

- **Property damage incidents** involving construction equipment or Project vehicles. The *default action* is to request an alcohol and drug test *unless* the investigation finds significant information that indicates drugs and/or alcohol *did not* play a part in the incident;
- **Injuries** - Where there are reasonable grounds to believe that an employee has sustained an injury or has contributed to the cause of an injury, with serious or major potential and where an unduly delay of required medical treatment will not occur, a request for an alcohol and drug test will be the *default action*;
- **Near-miss incidents** - The *default action* is to request an alcohol and drug test for individuals deemed to be significant contributors to near-miss incidents that have serious or major potential, other than those incidents reported voluntarily in a reasonable period of time by the persons involved.

5.5 Testing Procedure

Any Project personnel who are required to submit to an alcohol and drug test will be directed to an external health facility to conduct alcohol and drug tests. The employee will be transported home and/or placed on leave of absence pending the outcome of the test.

The employee will be requested to provide a sample for the alcohol or drug test administered by the retained health facility. Results from the first test (screening test) will be provided by the health facility to the ESHS Manager.

In the event a negative result is obtained from the screening test, WMMC reserves the right to arrange for a professional assessment of the employee to determine if the situation or incident for which the test was conducted is related to health reasons.

If the employee is found to be fit for work, then the employee will be cleared to return to work. In the event the employee is not totally fit for work, WMMC will determine, having regard for the requirements of the job, whether the employee will be permitted to return to work or not.

In the event a positive result is obtained from the screening test, the employee will be required to provide a further sample for a more definitive Alcohol and Drug Test (second test) to be analyzed by the independent and qualified health facility for that purpose. The employee will then be sent home on leave of absence pending the outcome of the definitive test.

An employee's refusal to submit to or provide samples for an alcohol and drug test will be considered a breach of this Policy and will result in termination of employment with cause.

The results of an employee's alcohol and drug test will be the property of WMMC, and will be placed in a sealed envelope and kept on-file in a secure area of the Project OHS office.

5.6 Results from Definitive Testing

The results of a definitive alcohol and drug test performed with respect to a situation or incident will be submitted directly to WMMC. Upon receipt of the results and before any action is taken, consultation among the WMMC management will ensure that the results are clearly understood.

In the event the results from a definitive alcohol and drug test confirm that the employee did not breach the standards set by this Policy, the employee will be

sent by WMMC/Contractor to a drug and alcohol addiction specialist or physician retained by WMMC/Contractor for a professional assessment to determine if there are health-related reasons for the situation or incident for which the test was conducted, unless such assessment was performed following the first screening test.

If the employee is found to be fit for work, then the employee will be cleared to return to work once approved by WMMC. In the event the employee is determined not to be totally fit, consultation among the parties involved (WMMC/Contractor) will determine, having regard to the requirements of the job, whether the employee should return to restricted work activities or not.

In the event the definitive test results confirm that the employee did breach the standards set by this Policy, immediate action by WMMC will be taken up to and including dismissal.

5.7 Referral to Counseling Services

All Project personnel may voluntarily seek help from counseling services for any alcohol or drug problem through their employer. Any employee who is receiving assistance from counseling services for an alcohol or drug problem will cooperate with the counselor and will comply with the terms and conditions of the employee's Rehabilitation Program.

An employee, who is under the care of counseling services for an alcohol or drug problem, will not be allowed to return to work unless and/or until:

- The employee is cleared to return to work, or receives permission from their attending physician to continue working, and;
- The counselor, following a consultation and taking into account the requirements of the employee's position (work activities), is of the opinion that the employee is mentally, physically and emotionally able to work and does not pose a safety risk to either himself/herself or any other workers.

5.8 Use of Prescription or Non-Prescription Drugs

All personnel using a prescription or non-prescription drug should only take that drug as directed, and should be aware of any potentially unsafe side effects. If the employee is unsure about the side effects of a prescription or non-prescription drug, then the employee will consult a physician or pharmacist. If there are potentially unsafe side effects or work limitations, then the employee will advise his/her supervisor of those effects or limitations.

5.9 Authority to Search and Seize

Where there are reasonable and probable grounds that an employee has breached this Policy, WMMC and/or any designated Project security staff may apply the appropriate search measures to that employee and the employee's personal property and effects, while at the Project area or in any vehicles associated with the Project. Any alcohol or drugs found during such search may be seized.

Incidents involving use, possession, sale, or distribution of illicit drugs on the Project premises may require WMMC to notify appropriate authorities.

5.10 Glossary

For purposes of this Policy, the following terms are defined:

Alcohol and Drug Test: A test to determine the presence of alcohol or drugs in the body through laboratory analysis of a blood, saliva or urine sample, and/or a screening test or other preliminary means of detecting the presence of alcohol or drugs in the body without laboratory analysis.

Drug or Drugs: Any harmful substance (including solvents) or any drug, other than a prescription drug that is used by the employee for whom it is prescribed and as directed by the prescription and any non-prescription medication used as directed by the manufacturer. (See Use of Prescription and Non-Prescription Drugs above).

Employee: Any person whose services are retained by WMMC/Contractor for work, as a regular, contractual or temporary employee, a trainee, a representative, an agent or a consultant.

Rehabilitation Program: A program that is tailored to address each individual's particular situation, ranging from education and counseling up to and including residential treatment.

Sample: A blood, saliva or urine sample required for laboratory analysis.

At Work: Any activity relating to the Project, which includes training and any coffee, lunch, supper or other breaks from work while on any lands or premises relating to the Project or in any vehicle.

6.0 Occupational Health and Safety Audit Program

This section describes the principles for conducting an audit of the Project OHSP. The primary objective of an OHS Audit is to verify that the Project OHSP is being properly and effectively implemented. It will also identify any shortcomings in each program and provide recommendations to make improvements.

Monthly audits of varying degrees of detail will be implemented during the Project. Audits will be initiated by the WMMC ESHS Manager. Audits involving Contractors will be carried out in consultation with a Contractor's On-Site Representative. Copies of all audit documentation will be transmitted to the WMMC ESHS Manager and Contractor's Senior Management On-Site Representative.

6.1 Performing the Audit

Each audit sub-item will be given a rating from 0 to 4 (0 = impending incident to 4 = excellent). Items with a rating of two (2) or less indicate an existing or potential problem and will be supported by an Audit Finding Report. Items with a rating of three (3) may, at the option of the auditor, be identified for improvement through an Audit Finding Report.

The concern will be clearly outlined and corrective action will be recommended. Corrective action will include the activity required for resolution to the problem, the individual responsible, the time allotted to correct the situation, and suggestions for preventing recurrence of the problem in the future.

6.2 Audit Follow Up

Project personnel are ultimately responsible for the implementation of all corrective actions recommended in the Audit Finding Report(s). At an appropriate time, the WMMC ESHS Manager will inspect the site to ensure all corrective action has been satisfactorily performed, will sign-off the Audit Finding Report(s) accordingly, and will complete the audit plan and report.

6.3 Audit Close Out

The WMMC ESHS Manager will review the Safety Audit. Depending on audit results, a summary report may be compiled which highlights recurring safety concerns, recommended changes to the Project safety plan, recommend supervisor training sessions, or any other pertinent data arising from the audit. This report may be further distributed, as the ESHS Manager deems appropriate.

6.4 Audit Rating System

Each audit sub-item will be rated from 0 to 4 according to the manner in which the intent or guidelines set down in the OHSP are being met.

- 0 = Unacceptable performance and poor attitude. Work stoppage required.
- 1 = Unacceptable performance but positive attitude, rapid improvements necessary, re-audit necessary.
- 2 = Acceptable, improvements necessary.
- 3 = Average performance, improvement desirable.
- 4 = Excellent performance and attitude.

Audit sub-items, which cannot be rated because inactivity in that area, will be identified as N/A (not applicable) and will not be incorporated into the rating. The overall acceptability of an audit item is the sum of all sub-item ratings (disregarding items marked “N/A”), divided by the total rating sum possible (number of sub-items not marked “N/A” multiplied by 4) and multiplied by 100, which expresses a percentage (**Table 1**). This allows the comparison of different sub-items in order to easily identify those areas that require more attention.

The ratings for specific audit sub-items can be trended from one audit to the next to show improvement or deterioration in safety performance. However, it is important to trend only individual items, not the entire audit contents as a lump sum because the items or areas being audited and the intensity of the audit will vary significantly between audits.

Table 1 Examples of Audit Ratings

Items	Rating
1) Physical Site Conditions	
Site access conditions	3
On-site access conditions	2
Dust control	4
Runoff (drainage) control	1
Layout area conditions	3
Material storage area conditions	N/A
Adequate traffic control	N/A
Hazards posted and barricaded	N/A
Weighted Rating	65 percent
2) Mining and Construction Equipment	
Inspection certificates	4
Roll-over protective structures	2
Lights	3
General appearance	2
Log books	4
Back-up alarms	3
Operator visibility	3
Positive air shut-off devices	3
Road worthiness	3
First Aid kits/extinguishers in place	4
Weighted Rating	78 percent

7.0 Occupational Health and Safe Work Procedures

The Occupational Health and Safe Work Procedures to be used during the Project are shown in **Table 2**. Additional procedures for work that may be required on a temporary and limited basis are in **Appendix A**.

Table 2 Safe Work Procedures

Sub-Section	Title
7.1	Personal Protective Equipment
7.2	Dredge Safety
7.3	Drilling Safety
7.4	Vehicle and Mobile Equipment Safety
7.5	Ladders
7.6	Fuel Handling and Storage
7.7	Welding, Grinding and Cutting Safety
7.8	Compressed Gas Cylinders
7.9	Hand and Electric Power Tools
7.10	Fire Safety
7.11	Fire Extinguishers
7.12	Use of Pneumatic Tools and Compressed Air
7.13	Chemical/Hazardous Materials Information
7.14	Common Hazards
7.15	Housekeeping
7.16	Identification of Hazards
7.17	Project Equipment and Tool Maintenance
7.18	Documentation and Record Keeping

For additional information, refer to the ERP of this Social and Environmental Monitoring and Mitigation Plan (SEMMP).

7.1 Personal Protective Equipment

7.1.1 General

Employees will wear appropriate PPE, during performance of their normal work activities. Material safety data sheets (MSDS) and manufacturer's specifications will be carefully checked to ensure that the type of equipment and material are suitable for the hazard.

Close-fitting shirts and/or jackets, and long pants (all in serviceable condition, without rips, tears, etc.) will be worn at all times in work area. Shorts and sleeveless shirts are prohibited. Offices, lunchrooms, and other designated areas may be excluded from certain aspects of this policy with prior written authorization of WMMC.

WMMC Management will ensure the availability, proper use and care of PPE, as well as require their workers to wear PPE when necessary for the workers' protection. Prior to use, all workers will be trained in the proper use and care of PPE. Workers will properly wear all such items where a hazard is known to exist or in situations where the workers personal safety is enhanced through its use.

All personnel, including visitors entering an active construction site will be properly equipped with approved head protection, eye protection and safety footwear. All articles of PPE will conform to the American National Standards Institute's (ANSI) and Mongolian requirements.

The WMMC Management is responsible to ensure that the following approved PPE, at a minimum, is available and used by all personnel (except as noted below).

7.1.2 Head Protection

Approved hard hats and liners will be legislatively compliant and worn in compliance with all manufacturers' recommendations.

7.1.3 Eye and Face Protection

Eye protection is intended to protect against such hazards as flying particles, chemical splashes, radiation (e.g., welding), sparks, etc. Eye and face protection will be cleaned regularly and replaced when lenses becomes pitted or scratched.

All eye and face protection will meet regulatory impact and compliance requirements.

Approved eye glasses complete with permanently attached side shields will be worn as required by Mine Safety and Health Administration (MSHA) standards except when

using other eye safety wear (e.g., welding hood, cutting glasses, etc.). Tinted or shaded glasses will not be worn at night, indoors or in poor light conditions. Specially designed (over the glass) safety eye protection will be worn over any non-approved eyewear.

In General:

- Goggles and face shields will be manufacturer approved;
- Cutting and burning goggles will be manufacturer approved;
- Flash glasses (shade 3 or 4) will be worn when working near electric arc welding;
- Burning goggles will be worn during oxy-acetylene cutting;
- Approved welders helmets will be used when welding;
- Leather hoods (or equivalent protection) will be worn when sandblasting, electric arc welding or oxy-acetylene cutting.

7.1.4 Fall Protection

All fall protection equipment will meet ANSI and Mongolian standards. In addition, the following legislative requirements will prevail in selection, use, and maintenance of fall protection in every potential work exposure. All such standard-included requirements and precautions will be followed in addition to those listed below.

- Safety harnesses, lanyards and double-locking snaps will be mandatory requirements for fall protection.
- Fall protection will be used at unprotected elevations of more than 1.8 meters, and at all times if the worker may fall into operating machinery, hazardous objects, or liquids.
- Tie-offs will preferably be well above head height, but no lower than shoulder height, to an anchor point capable of supporting 500 kilograms.
- Fall protection will be used when erecting or dismantling scaffolds.
- Fall protection will be worn when working from a ladder if higher than 1.8 meters.
- Horizontal and vertical lifelines and components will be of a manufactured system and used in accordance with the manufacturers' specifications. All manufacturers' specifications and documentation will be kept on-site. Horizontal lines will not have excessive sag.
- Fall protection devices will be inspected prior to each use, and will be subject to documented preventative maintenance inspections that include checking for cuts, wear, tears, burns, stitching failure, and deformation of hardware. Each device will be uniquely numbered.

7.1.5 Foot Protection

Approved serviceable footwear will be worn at all times. Footwear will incorporate box-type toe protection, sole/shank puncture protection, and will provide support for the ankle (a minimum of 150 millimeters from the sole to the top of the cuff).

7.1.6 Hearing Protection

Hearing protection will comply with ANSI and Mongolian standards. Hearing protection will be with workers at all times and will be worn whenever posted signs indicate their use, or when noise levels exceed 80 dBA (e.g., when it is difficult to hear a normal conversation from one meter).

7.1.7 Respiratory Selection

Respiratory equipment must be selected, worn and maintained in compliance with National Institute for Occupational Safety and Health (NIOSH) / Mine Safety and Health Administration (MSHA) certifications.

7.1.8 Body and Limb Protection

The proper clothing and PPE will be worn to provide body and limb protection as discussed below:

- Long trousers and long-sleeved shirts will be worn at all times (“Muscle shirts”, shorts, etc. will not be allowed.). Fire retardant clothing will be worn as required by WMMC/Contractor requirements.
- Gloves will be carried by workers at all times, and will be worn when performing a job activity that presents a hazard to the hands. Gloves will be of the correct type, style, material etc. to adequately mitigate anticipated hazards.
- Leather jackets and chaps (or equivalent fire-resistant material) in intact condition will be worn for protection during welding and other hot processes.
- Steel-toed boots will be worn for compacting, jack-hammering work, or other activities that expose the instep and lower leg to hazard.

The foregoing PPE requirement exclusions are noted. PPE will not be required:

- While within office buildings and office trailers;
- While being conveyed in a bona fide transportation vehicle intended solely for that purpose and only while totally enclosed and protected from external conditions; or

- For specific medically approved physical conditions and with expressed prior written approval of the ESHS Manager, On-Site Manager, or designate only if the conditions warrant as defined by the General Director.

7.2 Dredge Safety

7.2.1 General practices

Dredge operator and dredge supervisor training is essential to ensure that correct operation and maintenance practices are understood and implemented. Specific operating manuals should be developed for each dredge, and task training on the individual machines should be well documented. Personal flotation devices shall be worn on board the dredges and the floating process plant.

Emergency procedures should be posted in clear view in the operator's station. These procedures include what to do if a person falls into the water, fire or smoke is detected, alarms are sounded, etc.

Safe access should be provided to facilitate the change out of spud pins. In addition, repair before failure strategy should be developed and maintained for all equipment.

7.2.1.1 Communication

Two means of communication shall be established on board and maintained in good working order at all times (two-way radios, Nextel, or other cellular phones, etc.). Dredge operators must establish radio contact with other personnel on the dredge at a minimum of every 60 minutes. Data should be transferred and logged to assure this communication takes place (dredge pump amps, pipeline pressure, etc.).

7.2.1.2 Illumination

Each responsible person at a mine must ensure that each workplace used in a dredging operation is adequately illuminated at night. A person must not enter a non-illuminated part of a dredging operation at night unless the person or another person accompanying that person carries a light adequate to ensure the person's safety.

7.2.1.3 Head lines, side lines, and mooring lines

The Dredge Supervisor must ensure that, if necessary, warning notices are posted in conspicuous places to warn persons of danger from head lines, side lines and other drive lines or mooring lines. The Dredge Supervisor must ensure that each anchor for a head line, side line or other drive line or mooring line is of adequate strength.

7.2.1.4 Hypothermia:

All personnel must be trained in identifying the signs and symptoms of hypothermia which include: shivering dizziness, numbness, confusion, weakness, impaired judgment, impaired vision, and drowsiness. The stages of hypothermia are: (1) shivering; (2) apathy; (3) loss of consciousness; (4) decreasing pulse rate and breathing rate; and (5) death.

It is critical that all personnel be able to respond to hypothermia signs and symptoms and understand the following emergency procedures:

- Get the victim of hypothermia out of the cold and into dry clothing;
- Warm up his or her body slowly;
- Give nothing to eat or drink unless the victim is fully conscious; and
- Transport victim to hospital.

7.2.2 Safety Equipment

7.2.2.1 PPE and Water Safety

The Dredge Supervisor must ensure that any dredge used in a mining operation is equipped with life saving equipment as is necessary to preserve the lives and affect the rescue of persons who may fall overboard. The Dredge Supervisor must insure that any all life saving equipment is located in an easily accessible and conspicuous place; the Dredge Supervisor must also make certain that such equipment is immediately repaired or replaced when it is damaged or stolen. Each dredge shall at a minimum be equipped with the following PPE:

- A port and starboard throwable life ring with rope; and
- Extra sets of hearing protection, gloves, hard hats, protective glasses, electrical PPE, or any other PPE beyond the standard issue that may be required of visitors.

Workboats shall be equipped with a throwable flotation device. Extra personal flotation devices (PFD) and other PPE shall be readily available to visitors and a procedure implemented to ensure they are used. A second boat, for rescue use, shall be kept available on shore to travel to the dredge in case of emergency.

Shore areas where boats are moored/launched shall be equipped with sufficient lighting. Flashlights shall be issued to dredge operation and maintenance personnel and their proper operation should be part of the daily equipment checklist.

7.2.2.2 Protection/Safety Systems

The following protection/safety systems shall be installed on each dredge. Dredge operators must be properly trained to use and troubleshoot failure of the following protection/safety systems.

- Automatic fire suppression systems are not required; however, adequate fire extinguishers for the correct application should be available on board all work boats and dredges, and included on the daily equipment checklist.
- Engine emergency shutdown systems that sense loss of coolant flow, high-coolant temperature, low oil pressure, and low oil level should be installed on all diesel-powered dredges and included on the daily equipment checklist.
- Emergency engine “kill” switches should also be installed in the operator’s station and near the engine compartment for quick access.
- Gauges that monitor the engine systems, marine transmission, hydraulic oil, and other critical variables should be installed in the operator’s cab in clear view and maintained in good working condition.
- Bilge pumps should be operable on a battery back-up system in case of electrical failure or there should be access to extra portable bilge pumps.
- A high-water alarm should be placed where it is visible and/or audible in the operator’s cab.
- An adequately sized, gas-operated portable pump should be kept on board each dredge in case of emergency and should be tested weekly and documented on the daily equipment checklist.
- Each dredge should have an effective electrical grounding system.
- Emergency spill management kits should be kept on board every dredge to be used in the event of an oil spill.

7.2.2.3 Inspections

The Dredge Supervisor will ensure that:

- the hull of a dredge is maintained in a sound and watertight condition;
- buoyancy compartments and ballast compartments are maintained so as to ensure the stability of the dredge;
- freeboard is maintained to suit the prevailing operating conditions;
- suitable means are provided to prevent persons from falling overboard and sideboard guard rails are required;

- warning systems or devices are provided to warn that machinery is about to be started;
- automatic electrical or mechanical devices are provided that immediately stop any apparatus for breaking out or raising material from the working face in the event of an overload which might affect the stability of the dredge; and
- devices are provided that indicate variations in the list and the fore and aft trim of the dredge.

7.2.2.4 Hull and Pontoon Inspections

All pontoon cavities that do not store fuel should be visually inspected at a minimum of once each week, and documented on the daily inspection checklist.

Visual and ultrasonic hull inspections must be performed at the minimum of once per year. Visual and ultrasonic inspections should be performed by qualified inspection teams.

A copy of all inspections should be kept in the machine file at each site. A second copy should be forwarded to the respective safety department. Company- or operation-specific maintenance plans should be developed to ensure inspections are performed at the specified intervals.

7.2.2.5 Workplace inspections

All dredges must have daily operational checklists identifying standard required checkpoints. Space should be allocated for operator comments on any potential items of concern. Pre- and post- shift mechanical inspections are to be performed prior to the start of each operating shift or change of operator. All pre-post shift mechanical inspection sheets are to be reviewed by the area supervisor who is responsible for the daily operation of the dredge. Electrical workings should be inspected by knowledgeable staff at a minimum of every month. The ESHS Manager should schedule any needed repairs with the maintenance department accordingly, with safety issues given the highest priority.

All dredges should have a copy of the operation and maintenance manual in the cab of the dredge for operator access. This manual should include copies of any job hazard analysis (JHA) pertinent to dredge maintenance.

7.2.3 Preventive maintenance practices

7.2.3.1 General

All preventive maintenance schedules should mirror those recommended by the original equipment manufacturer of the individual components. The established preventive maintenance and lubrication schedules should be developed and documented in the machine file.

Repair and maintenance costs must be recorded for overhaul/replacement evaluation and comparison. The On-Site Manager will determine the method of recording costs. As a minimum, the method chosen will identify and record the operating hours, component hours, repair, and scheduled maintenance for the current period and life to date of each dredge. Adequate levels of spare parts should be kept on site, or shared between closely located facilities, to minimize downtime.

Scheduled oil sampling programs will be established for predictive maintenance purposes. Component hours should be included in oil sample documentation. Notification of responsible persons, when scheduled oil sampling problems are detected, will be established.

7.2.3.2 Lifting and hoisting equipment

Ladder (boom) cables should be inspected daily and replaced a maximum interval of six months. All hoisting sheaves should be inspected and lubricated on a daily basis. Where feasible, permanent safe access shall be provided to access hoist sheaves. Maintenance plans should be developed to ensure that qualified inspectors, on an annual basis, inspect all winches used in hoisting operations.

Any operator of cranes and hoist shall understand the health and safety procedures, as outlined in **Appendix A**.

7.3 Drilling Safety

Specific drilling safety rules and requirements are developed to protect project personnel from injury or illness by providing equipment, direction, and guidance, which will minimize exposure to potential hazards.

All personnel on-site will comply with the following rules in regards to PPE and attire.

- ANSI--approved hard hats will always be worn.
- Gloves will be worn to protect hands when handling wire rope.

- When working in the mast, safety belts will be worn, and tools will be securely attached to the belts by lines.
- Before ascending, safety shoes will be cleaned of all mud and footholds will be inspected for grease.
- Safety boots will be worn by all personnel where such hazards exist that could cause injury to the feet from falling objects; and will be in good condition with high ankle and steel toe protection and without loose or worn soles.
- Personnel will not wear loose or flapping clothes or jewelry.
- Safety glasses will be worn at all times in work locations, including shop areas.
- Earplugs will be used when entering any high noise operation or where hearing protection required signs are posted.
- Clothing saturated with oil or chemicals will be changed immediately.

All standards in this document and such standard-included requirements and precautions will be followed in addition to those listed below.

- Hold a safety meeting at the Project start-up regarding the drill rig operator responsibility for rig safety and any site and equipment specific safety requirements.
- All team members should know the location of the kill switch
- Make eye contact with the operator prior to approaching equipment
- Do not wear loose clothing or equipment near the rotating drill pipe; stay clear of auger or drill pipes; never use hands or feet to move cuttings away.
- Never place your hand or other body parts on or under the rotating or moving drill pipe
- At least two persons must be present when advancing the drill pipe
- Stand clear if possible
- Wear hard hat, eye protection, steel-toed boots
- Be aware of the potential for cables to snap or hydraulic lines to brake or systems to fail
- Keep the work area free from debris
- Fire extinguisher must be available
- Sheave guards will remain over all moving gears and chain drives.
- The drilling table, or platform, will be kept free of loose tools, both to prevent accidents to personnel and loss of tools down the drilled hole. The platform will also be kept clean and dry as possible.
- Personnel will not attempt to lube or adjust moving gears.
- When hoisting loads, personnel will not place themselves between any moving part and stationary object;
- Personnel will not climb on any vertical equipment unless it is properly secured and supported.

- All pressure will be removed from vessels, lines, regulators, meters, fittings, and connections before disconnecting, moving or working on them.
- Personnel will not hammer on lines or fittings that are under pressure.
- Before making lifts, lifting equipment will be visually inspected for deformities or cracks. Worn or broken hooks will not be used on hoisting equipment.
- Personnel will stay clear of suspended loads.
- All parts will be replaced or repaired as needed.
- Personnel will practice good housekeeping. For example, tools and litter will be immediately picked up and properly stored and disposed, respectively, and slippery floors will be cleaned immediately.
- Office areas, certain shop areas, and all work areas on rig locations will be designated as "Smoke Free" zones. Smoking will be allowed in designated areas only.
- Set up sample table and general work area to the side of the rig and not directly behind it.
- Before moving the rig to the next location, the rig operator to the extent possible:
 - walk the planned route of travel and inspect it for depressions, gullies, ruts, and other obstacles;
 - Check the brakes of the truck/carrier, especially if the terrain along the route of travel is rough or slope;
 - Discharge all passengers before moving on rough or steep terrain;
- Driving drill rigs along the sides of hills or embankments should be avoided; however, if side-hill travel is necessary, the operator must conservatively evaluate the ability of the rig to remain upright while on the hill or embankment.
- When close lateral or overhead clearance is encountered, the driver of the rig should be guided by another person on the ground and stay away from overhead and buried electrical lines.
- Loads on the drill rig and truck must be properly stored while the truck is moving, and the mast must be in the fully lowered position.
- After the rig has been positioned to begin drilling, all brakes and/or locks must be set before drilling begins. If the drill rig is positioned on a steep grade and leveling of the ground is impossible or impractical, the wheel of the transport vehicle should be blocked and other means of preventing the rig from moving or tipping over employed.
- Before a drill rig is positioned to drill, the area on which the rig is to be positioned should be cleared of removable obstacles and the rig should be leveled if sloped. The cleared/leveled area should be large enough to accommodate the rig and supplies.
- The location of the overhead and buried utility lines must be determined before drilling begins, and the locations should be noted on boring plans and/or assignment sheets.

Employees will properly follow all emergency action procedures if an emergency occurs (see the **ERP** of this **SEMMP**).

7.4 Vehicle and Mobile Equipment Safety

7.4.1 General

Without limiting the Contractor-legislated obligations, all work will be performed in full compliance with these listed requirements.

- Inspect vehicles prior to use.
- Verify the equipment and supplies are secured prior to vehicle movement
- Obey traffic laws
- Wear seat belts
- Leave enough time to get to your destination without hurrying
- When possible avoid backing up
- Park clear of traffic
- Wear hi-visibility vests with reflective strips when working near vehicle traffic
- All personnel using mobile equipment and motorized vehicles will be in possession of a valid driver's license suitable for the equipment operated.
- Workers will not start any mechanical equipment unless thoroughly familiar with its operation and authorized to do so.
- All equipment will be operated by qualified, competent personnel.
- All operators of personnel hoists and platforms will be trained in the operation thereof, preferably through a program established by the manufacturer.
- All equipment will have, at a minimum, a 10-kilogram ABC fire extinguisher mounted at a location easily accessible to personnel and protected from external damage.
- Safety devices will not be tampered with, modified, or bypassed.
- All vehicles will have backup alarms.
- Wheel chocks will be consistently used to block the movement of parked vehicles.

7.4.2 Pre-Use Equipment Check

Project personnel will ensure that inspection of construction equipment for compliance with regulatory and Project safety standards is performed. Deficiencies will be corrected prior to the use of the equipment. Equipment will require a mechanic's certification of worthiness (or appropriate alternate documentation) prior to use. Such documentation will be presented to the ESHS Manager for audit prior to starting work on a regular basis of once each shift.

7.4.3 Inspection Before Use

Machinery guards provided for protection against revolving or reciprocating parts will be in place before the engine or equipment is started.

Operators will inspect the unit at the start of the shift to ensure operating reliability and proper functioning of all safety alarms and features.

The operator will not operate the unit if judged unsafe to do so. Units with improperly working safety features will be taken out of service until repaired.

7.4.4 Operation

All workers involved with directing the operation of the unit will use a clearly defined method of signaling the operator.

Whenever the operator's view of the intended path of travel is visually obstructed, signal men or spotters located outside the vehicle will be used for all restricted access and backing up activities (with the exception of back hoes, front-end loaders, and bulldozers, where backing up is a regular/routine part of the task). In such instances, and with prior consultation with WMMC, warning signs and/or barricades may be used to keep such work areas safe.

Prior to backing up, the driver will walk to the back of the vehicle to verify that it is safe to do so (except where signal men or spotters perform that function).

Employees will not ride on any equipment not provided with a manufacturer's designed and installed seat or platform for the purpose.

Loads will not be left suspended while the equipment is left unattended.

Equipment power units will be shut down during all refueling and servicing operations.

When maintenance procedures are to be carried out, equipment will be suitably locked out and tagged or rendered immobile during the maintenance work. All pinch points will be blocked or locked open (see the Safe Work Permit System section).

All vehicles left unattended will have the parking brake applied, the motor turned off, and wheel chocking in place. The WMMC ESHS Manager will be consulted prior to mobilization.

Each operator will promptly notify his/her supervisor of any defects in the equipment. No equipment, tool or process will be allowed to start if any such defects exist.

7.4.5 Personnel Safety

Personnel will keep well clear of cables or rope being used to pull other equipment.

Personnel present in areas of high equipment traffic, such as the site preparation phase of the Project, will wear a high visibility fluorescent vest.

7.5 Ladders

All ladders will be Grade 1 (heavy duty), and comply with applicable legislation. Site-built construction ladders will conform to prevailing legislation.

Only wooden or fiber glass ladders will be used. Metal ladders are a potential hazard near electrical installations and are not allowed.

Wooden ladders will not be used in proximity to electrical equipment. Only fiberglass ladders will be used when there is a requirement to work in close proximity to electrical equipment.

Wooden ladders will not be painted or treated. Ladders will be of an appropriate length and material to suit the job requirements.

It is the responsibility of each worker to ensure that prior to each use, ladders are checked for:

- Structural rigidity;
- Tight and secure joints;
- Missing or broken rungs;
- Damaged hardware or fittings;
- Excessive wear or splints in wood;
- Free movement of operating parts, particularly for gravity-action ladder locks on extension ladders;
- Worn non-skid feet;
- Ropes, cables and hoses on the ladder that could be a tripping hazard;
- Deteriorated or worn ropes on extension ladders; and
- Dents and bends in side rails and rungs that might weaken a ladder's integrity.

Damaged and unsafe ladders will be clearly tagged as unsafe and immediately removed from the work site for repair or scrapping.

Workers will not carry loads up ladders. Both hands will be free to grip the rails. Tools and equipment will be carried in suitable tool belts, or drawn up with hand lines separately.

Ladders will not be placed in front of doorways, unless the doorway is locked or blocked and signs are posted on both sides.

No tools or materials will be placed at the base of a ladder.

Footwear will be kept free of mud oil or grease to prevent loss of footing.

7.5.1 Stepladders

- Stepladders will only be used on a clean, level and solid base.
- Stepladders will only be used in the fully open position with the spreader bars locked.
- A worker will not stand on the top two steps of the ladder (the cap is not considered a step).
- Workers will not overreach sideways on stepladders; rather, the ladder will be repositioned.

7.5.2 Extension ladders

- Ladders will extend a minimum of one meter above the top of a platform of landing.
- The ladder will be situated from the wall, or vertical, a distance of 25 percent of the height.
- The ladder will be secured at the base by another worker(s) until it has been securely tied off at the top and bottom (or as prescribed in the applicable legislation).
- A worker will not stand on the top two rungs of the ladder.
- The ladder will have a minimum overlap of one meter of the sections.
- Extension ladders will be equipped with a rope and pulley for raising and lowering.
- Ladders will be carried horizontally, never vertically.
- Work from extension ladders is not recommended and will be considered only if scaffolds or man lifts cannot be used.
- An additional person will hold and secure the base of the ladder.

7.6 Fuel Handling and Storage

7.6.1 Above Ground Storage

a) Considerations for the location and construction of fuel storage areas will be in accordance with all applicable legislation and the following:

- Consideration will be given to the fuel site drainage such that spillage will not readily access water courses, gravel beds or campsites;
- All brush or other flammable material, such as lumber or gas cylinders, will be kept at least 10 meters from any storage area;
- Earthen berms or dikes will be created with suitably impervious material to contain possible spillage. These will be capable of containing 150 percent of the total storage volume;
- Ponding inside dikes due to rainfall or runoff will be controlled to avoid floating empty tanks;
- Adequate access on 360 degrees will be provided for fire control activities;
- Fuel or oil stored in drums will be segregated and treated as a separate unit or dock;
- Tanks and containers will be conspicuously marked with the name(s) of the content(s), and "FLAMMABLE" and "NO SMOKING" signs will be posted in hazardous areas. "SHUT OFF ENGINE PRIOR TO FUELING" signs will be posted at vehicle fueling points; and
- All dispensing locations will be equipped with appropriate grounding cables, clamps and attachment points to preclude any possibility of static discharge.

b) Where 2,000- to 5,000-liter elevated gravity fill-type tanks are installed, the following criteria will be met:

- Tanks will be located more than 25 meters from structures and more than 10 meters from workshops or offices/trailers;
- The support stands will be in sound condition - no bent or buckled cross braces or struts;
- The legs will be on solid spread footings of wood, metal or concrete capable of taking the point loading without settling;
- Proper ladders and/or access platforms will be available for refilling procedures;
- The tank will be equipped with a manual lockable shutoff valve, in addition to a self-closing valve on the end of the hose and an approved vent;
- Conductive, bonded fuel hose of at least five meters in length will be used for fueling; and

- A Purple K dry chemical fire extinguisher or equivalent of not less than nine kilograms will be readily available¹.
- c) Where one or more portable 30-to-65-cubic-meter vertical skid-type tanks with pump-assisted loading are used, the following will be required:
- Tanks will be located at least 25 meters from any construction buildings and 50 meters from any structure;
 - The tanks will be set on firm ground within the area of the dike;
 - Each tank will have a separate dike;
 - Tanks will be at least five meters apart, wall-to-wall;
 - Each tank will be equipped with:
 - An approved volatile liquid vent having a flash-resistant screen;
 - A small, low-point drain valve (fire rated) for draining water (will be plugged when not in use);
 - Access to the tank top for gauging;
 - An electrical grounding point; and
 - Valves that will be locked when not in use.

7.6.2 Pump and Piping Installation

At all temporary fuel storage areas, the following piping, pumps and valves requirements will be met:

- Suction and or fill piping will be steel with welded or threaded joints. Short sections of flexible fire-proof hose will be used to connect the pump to the system;
- The fill point will be equipped with a check valve and a block valve;
- If a pump is connected via a manifold to several tanks, each tank suction will have a block valve;
- All pumps used for fuel transfer will be approved for handling volatile fluids and will be equipped with a built-in bypass/re-circulation relief valve;
- The pump will be mounted on a suitable footing such that no undue stress is placed on the suction lines;
- The pump will be grounded or bonded electrically to a grounding device;
- The pump will be at least five meters from the tank or tanks and inside the dike or in a separate dike area; and
- Non-approved equipment (e.g., water pumps) will not be used for the transfer of volatile fuels.

¹ The Purple K dry chemical fire extinguishers contain specially fluidized and siliconized potassium bicarbonate dry chemical which is particularly effective on Class B flammable liquids and pressurized gases. It is electrically non-conductive and has aluminum valves.

7.6.3 Refueling Stations

In the design of temporary fueling stations, the following procedures will be adhered to:

- The fueling station will be at least 10 meters from the storage tanks;
- A suitable approved and electrically bonded flexible hose complete with a self-closing nozzle will be installed;
- A 67-kilogram Purple K dry chemical, wheeled fire extinguisher or equivalent will be readily available;
- Adequate “NO SMOKING” and “SHUT OFF ENGINE PRIOR TO FUELING” signs will be posted;
- A remote stop station for the pump will be installed at the fueling station;
- Safe, adequate lighting will be provided for night operations;
- An adequate storage rack for the flexible hose will be provided; and
- Refueling operations will be attended at all times. Should the operator leave for any reason, the pump will be shut down.

7.6.4 Refueling Vehicles

Where pickups or similar small trucks are used for refueling purposes, the following conditions will be met:

- The trucks will be equipped with an operable Purple K or equivalent extinguisher of at least nine kilograms;
- The tanks will be solidly secured to the trucks with fastenings capable of restraining the full weight of the loaded tank;
- Any powered pump used to transfer the fuel will be equipped with a pressure-relief valve or a bypass valve to prevent overpressure should the discharge be closed or blocked;
- All pumps will have ANSI/UL (Underwriters Laboratories) or equivalent approval for flammable hydrocarbons;
- Only hoses approved for fuel transfer will be used;
- Trucks will be marked "Flammable" and comply with applicable legislation; and
- Trucks will carry suitable absorbent materials to clean up small spills.

Where trucks with dedicated fixed tankage are used for refueling, the following additional conditions will apply:

- The trucks will be equipped with not less than one operable Purple K extinguisher or equivalent;
- The exhaust systems of the truck will not pass under any point where fuel leakage may drip or spray onto a hot surface;
- Fuel dispensing hoses will be of approved electrically conductive types with automatic shut-off nozzles;

- Fuel transfer pumps will have pressure-controlled bypass systems and will have ANSI/UL or equivalent approval for flammable hydrocarbons;
- Trucks will be marked "Flammable" with appropriate hazardous product warning signs; and
- Trucks will carry suitable absorbent material to clean up small spills.

7.6.5 Refueling Procedures

General procedures to be followed when refueling equipment are the following:

- Minor spills will be cleaned up promptly;
- All spills will be reported to the Contractor and the ESHS Manager;
- Vehicle engines will be shut down during refueling operations;
- Small stationary engines with integral fuel tanks will be shut down during refueling operations within 200 meters of fueling;
- If fuel cans are used for refueling, they will be approved metal safety fuel cans with a flash-arresting screen, a spring-closing lid and a spout cover that will safely relieve internal pressure if exposed to fire;
- Smoking or open flames will not be allowed within 100 meters of the fuel storage tanks, fuel pumps or refueling operations; and
- Spill pans/trays will be used wherever possible and feasible.

7.7 Welding, Grinding and Cutting Safety

7.7.1 General: Contractor Requirements

Due to the high temperatures involved in welding, cutting and the forming of hot metal, it is essential that fire prevention precautions be rigorously observed wherever these operations are performed. Welding will not be carried out in enclosed areas where explosive or flammable materials (vapor, liquid or solid) may be present. Appropriate actions will be taken to remove such materials and to ensure they are not present during welding or burning.

Drums containing, or previously containing, flammable or combustible materials or chemicals will not be used as welding benches and will never be cut using a cutting torch or grinder.

Fire extinguishers will be kept at hand and ready for immediate use in case a fire starts.

7.7.2 Personal Protective Equipment

The following clothing is recommended for welders:

- Hard hats will be worn by welders when not actually in the process of welding. Hoods are required for welding;
- Head and facial hair will be protected at all times during welding. No hair may interfere with the proper facial seal of any required respiratory protection;
- Leather is the recommended material for welders' outer protective wear;
- Synthetic fibers that melt or become flammable on contact with heat will be avoided;
- Pants will have no cuffs, and will not be worn tucked inside of boots;
- Shirt pockets will have flaps and be kept closed;
- Steel-toed boots will meet applicable legislation, and be laced to the top;
- Gauntlet-type gloves will be worn;
- Clothing will not be frayed, oily or contaminated; and
- Fire retardant coveralls will be required for welding around equipment or piping charged with hydrocarbons.

The welder will have eye protection when welding or grinding against the high intensity light rays, ultra-violet light rays, infra red rays, heat, flying metal particles, sparks and slag. Selection of lens shades will always equal or exceed the manufacturer's requirements. It is recommended that the welder use the highest possible shade number whereby the weld zone remains visible. All personnel shall also wear eye protection or not look at welding sparks.

Adjacent personnel will be protected by appropriate barriers or screens erected by welding personnel, and will wear suitable eye protection. Goggles and/or a face shield will be worn at all times when cold cutting with a grinder or saw.

Cutting goggles will be worn when torch cutting, and welding lenses will be worn when cutting with arc air. Regular safety glasses will not be used in place of cutting goggles or welding lenses. A clean glass/plastic lens will be positioned in front and behind the filter lens to protect it from damage.

Workers will wear tight/snug fitting clothing, gloves and eye protection while grinding. All employees in the vicinity of a grinding operation will wear the appropriate eye protection.

- The grinder operator will wear respiratory protection when dusty or toxic metals are being ground; and
- The grinder operator will wear a full-face shield as well as approved safety glasses while operating a grinder.

Welders will be provided with proper ventilation (e.g., fans, air ducts, outdoors). Welding screens will be arranged such that they do not restrict ventilation.

When welding on non-ferrous or galvanized metals, extra ventilation is required. In some circumstances, it may be necessary for the operator to use a respirator or mask.

Special precautions will also be taken into account when welding with argon, carbon dioxide (CO₂) or other asphyxiant. Proper ventilation and/or breathing protection will be used.

7.7.3 Welding

When welding on existing tanks, vessels or piping, proper precautions will be taken to ensure that the vessel or pipe has been cleaned, purged, vented and tested for the presence of combustible gases.

The welding ground will be a continuous cable from the machine to the object being welded. The use of the following items for a ground system is prohibited:

- Any pipeline, especially oil, gas, steam or chemical lines;
- Stairs or handrails;
- Structural steel buildings;
- Steel light or power standards; and
- Pumps or other rotating equipment (particularly with shaft bearings which could seize to the shaft due to arcing).

When connecting or splicing lengths of welding cable, substantially insulated connectors of a capacity at least equivalent to that of the cable will be used. If cable lugs are used for joining, they will be securely fastened together by more than one bolt to give good electrical contact. The exposed metal parts of the lugs will be completely insulated.

A five-kilogram ABC dry chemical/equivalent fire extinguisher will remain within three meters of the welder operator at all times.

7.7.4 Cutting

Workers will ensure that sparks, flames, or other hot objects do not endanger other personnel.

A proper striker will be used to light a torch. Cigarette lighters or matches will not be used.

A fire extinguisher will remain near the worker who is using the cutting torch at all times.

7.7.5 Grinding

Precautions to be used when grinding include:

- All grinding wheels will be equipped with a safety guard;
- Tool rests are required on bench grinders and will be securely attached to the grinder;
- Tool rests will be set three millimeters from the face of the grinder and set below the center line of the wheel;
- Grinding stones and wheels will be inspected frequently to ensure no chips or cracks exist that may cause failure; and
- The rated rotational speed of the wheel or disc will not exceed that of the grinder to which it is attached.

7.8 Compressed Gas Cylinders

All cylinders and related equipment will be handled and stored in full compliance with all applicable legislation.

7.8.1 General

Compressed gas cylinders will:

- Be clearly identified in accordance with applicable legislation with regard to contents;
- Be kept on a specially designed cylinder trolley with retaining chains when in use;
- If transported by crane, hoist, or derrick, be handled in a suitable cradle, nets, or skip boxes - never by rope, chain slings, or slings choked around the body; and securely stored before moving;
- Have hoses and gauges removed, and valve guards installed whenever cylinders are transported, stored, or not in use;
- Have cylinder valves and gauges kept clean and free from oil, grease and other hydrocarbons;
- Be protected from physical damage, and kept away from areas where they can absorb undue heat or be a hazard in a fire situation;
- Not be placed in confined spaces or non-ventilated areas;
- Not be placed near electrical panels, or in proximity to welding grounds; and
- Only be refilled by authorized personnel.

7.8.2 Storage

- Compressed gas cylinders will be stored, used and transported in a secure, upright position, even when empty;
- Oxygen cylinders will be separated from highly combustible materials, especially oil and grease and other fuel gas cylinders by a minimum of 8 meters, or by a 1.5-meter-high non-combustible barrier;
- Storage areas will be clearly identified regarding contents of cylinders, and empty cylinders will be marked as such;
- Storage racks will be specifically designed to keep cylinders upright;
- "No Smoking" and other appropriate warning signs will be posted in the area; and
- Fire extinguishers will be placed in the immediate vicinity.

7.8.3 Regulators and Hoses

- Flashback devices will be installed at both the regulator and torch end of oxygen/fuel gas systems used for cutting or torch welding;
- Before connecting gauges to compressed gas cylinders, the valve will first be opened (away from personnel or ignition sources) slowly to clear any debris;
- Grease or oil will not be applied to any cylinder threads or gauges. Instant combustion will take place if hydrocarbons are exposed to pure oxygen;
- Before removing the hose assemblies, the cylinder valves will be closed, and then the hoses will be bled of gas by opening the regulating valves at the torch; and
- Hoses will be inspected for leaks frequently, particularly at the connections.

All manufacturer/distributor recommended pre-light and lighting procedures and guidelines will be followed.

7.9 Hand and Electric Power Tools

7.9.1 Hand Tools

- Cutting tools will be kept sharp. Worn or broken tools will be replaced;
- Tools will be carried in proper pouches or toolboxes. Tools will not be carried in pockets;
- Knives will have retractable blades that will remain retracted or sheathed when not in use;

- Tools with loose or broken handles will not be used;
- Ends of metal striking tools such as chisels will have mushroomed ends dressed;
- “Snipes” or metal tubes will not be used on wrenches to increase leverage, unless designed for that purpose;
- Hammers will only be used on special spanners designed to be struck with a hammer; and
- Gloves and safety goggles will be worn when working with hand tools.

7.9.2 Electric Power Tools

- A copy of the manufacturer's instructions/specifications will be kept at the Project area for each type of power tool;
- Portable electric drills, saws, etc., will be equipped with three conductor-grounded cords, polarized plugs, or ground fault circuit interrupter (GFCI) receptacles to ground non-current carrying metal parts;
- Extension cords and connections will be ANSI/UL or equivalent designation with a voltage rating of 600 volts, and will be maintained in good condition;
- Manufacturer-installed guards will not be removed or modified, and will be used as equipped by the manufacturer;
- Tools will be physically disconnected from the power source when making adjustments or changing attachments;
- Trigger-locking devices will not be used;
- Power tools will not be hoisted or handled by the cord. They will be disconnected from power receptacles by removing the plug, and not by pulling on the cord;
- Cutting or abrasive attachments such as blades, discs or bits will be the proper size and rating for the power tool being used;
- Portable power-driven circular saws:
 - Will be equipped with guards or hoods that automatically adjust themselves when the saw is in use;
 - Will have a saw guard equipped with a handle so it may be temporarily retracted safely;
 - Will have guards that cannot be blocked or locked in an open position;
 - Will have safety switches that operate the motor only while the switch is held in the closed position.
- Horizontal pull saws (radial arm):
 - Will have a blade that is encased on each side so that the upper half of the blade and arbor ends will be covered;
 - Will have limit chains or stops to prevent the saw from moving beyond the front edge of the table; and
 - Will have an effective device to return the saw automatically to the back of the table when released.

7.10 Fire Safety

7.10.1 General

These procedures, together with the Contractor fire control measures,, together with the Contractor fire control measures, will be used to establish and affect fire safety control at the Project area. These procedures cover activities of a supervisory and administrative nature concerned with controlling, directing and instructing site personnel in fire prevention and control. It is intended to protect the safety of all personnel working within the confines of the Project area.

7.10.2 Responsibilities WMMC

WMMC will ensure that all applicable regulations concerning fire prevention and control are strictly followed at the Project area.

WMMC will ensure that all equipment, including mobile equipment and welding machines, is equipped with properly approved fire extinguishers as required. WMMC will ensure that all personnel have a basic knowledge of firefighting equipment, especially fire extinguishers and also ensure that all personnel know the location of all firefighting equipment and ensure that access to all firefighting equipment is maintained at all times.

The following procedures are intended to serve as easy-to-read guidelines and checks for fire prevention at the Project area. They are not intended to replace any applicable regulations on fire prevention, control, and safety.

7.10.3 Firefighting Equipment

All fire extinguishers and hose equipment will be installed and maintained according to the prevailing legislative/Fire Code standards. Halon fire extinguishers will not be used.

7.10.4 Reducing Ignition Hazards

All electrical wiring and equipment will be installed according to the requirements of the Electrical Code/prevailing legislative authority or equivalent electrical code.

Exhaust systems of all internal combustion engines will be located away from combustible materials and safely isolated from building structures.

- Smoking will only be allowed in designated areas.

- Open flames will be prohibited in all areas, except where operating under a specified Safe Work Permit.
- Non-sparking- or "hazardous location"-type battery-powered equipment will be used in any potentially hazardous/explosive/flammable atmospheric condition.
- Nozzles of air, inert gas, steam lines or hoses will be electrically connected if used in cleaning or ventilating tanks or vessels containing flammable materials.

7.10.5 Temporary Buildings

Temporary buildings will be erected no less than 3.5 meters (or legislated stipulated separation) apart, and located in a manner that allows for an unobstructed exit. Construction material will have a fire resistance rating of not less than one (1) hour (per applicable legislated requirement).

7.10.6 Storage Outside Storage

Flammable materials will not be stored within 3.5 meters of any building. The stacked height will not exceed 7 meters.

Suitable fire extinguishing equipment will be easily accessible. All outside storage areas will be free of unnecessary combustible materials.

7.10.7 Inside Storage

All exits will remain unobstructed.

Stacked material will provide free access for firefighting.

All materials will be stored, handled, and stacked with due regard to their flammability.

Adequate clearance will be provided around lights and heating equipment.

7.10.8 Temporary Heating Devices

All heating devices will be approved for their intended purpose and will meet relevant or prevailing legislated standards.

7.10.9 Ventilation

With no undue rise in temperature, a sufficient supply of fresh air will be provided to ensure the health and safety of personnel.

7.10.10 Clearance and Mounting

- Clearance between heating devices and any combustible material will meet the requirements of applicable legislation and examined by the Safety Officer;
- Heaters not suitable for mounting on wood floors will be set on heat-insulating material equivalent to at least 25-millimeter concrete that extends beyond the heater by at least 0.6 meters in all directions;
- Heaters will be located at least 3 meters from potential wind-blown covering material (e.g., tarpaulin, canvas) and securely fastened to prevent upset.

7.10.11 Stability

All heaters will be set horizontally and level, unless the manufacturer's design permits otherwise.

7.10.12 Oil-Fired Heaters

- Oil-fired heaters will be equipped with positive flow-stop control in case of flameout.
- Heaters designed for barometric or gravity feed will be used with integral stands.
- Heaters not designed for flue connection will be equipped with integral tanks of no more than a 9 liter capacity.
- Heaters specifically designed and approved for use with separate supply tanks may be directly connected for gravity feed or by automatic pumps.

7.11 Fire Extinguishers

7.11.1 General

Hand-operated fire extinguishers are firefighting appliances designed to deal with small fires at an early stage. They are available in several classifications, each designed to deal with a particular type of fire. Extinguishers are effective only if the correct classification is used; are serviceable; placed in the most advantageous positions; and are used by personnel who have had instruction.

Project personnel and contractors may be required to participate in fire extinguishing emergency response activities and, therefore, must receive training in fire extinguisher use.

Due to versatility, the 10-kilogram ABC extinguishers will be the minimum standard. Fire extinguishers will be dry chemical and foam types only.

Although fire extinguishers are easily identifiable and bear adequate printed instructions, it is essential that all personnel likely to use them receive regular instruction on their maintenance, operation, and location.

NOTE: Halon extinguishers will not be used due to the risks of breathing the hazardous gases in poorly ventilated areas.

7.11.2 Classification

Every fire extinguisher will have Underwriter's Laboratories approval or equivalent current certification.

Fire extinguisher classifications are:

- Class A: For fires in normal combustible materials such as wood, cloth, paper, trash, and plastic;
- Class B: For fires in flammable liquid, oil, grease, tar, oil-base paint, lacquer, and flammable gas;
- Class C: For fires involving energized electrical equipment or systems; and
- Class D: For fires in combustible materials, such as magnesium, titanium, zirconium, sodium, lithium, and potassium.

7.11.3 Required Locations

- All office and lunchroom buildings and trailers. At least one (1) extinguisher per 232 square meters of floor area on each floor;
- In all warehouse buildings, storage trailers and tool cribs. At least one (1) extinguisher per 116 square meters of floor area on each floor;
- All construction vehicles (including half-ton trucks), cranes, welding machines, and any equipment that has an internal combustion engine. At least one (1) extinguisher per vehicle or unit;
- All fuel and flammables dispensing and storage locations. At least one (1) extinguisher per 60 square meters of floor area; and
- Within five (5) meters of sources of ignition, such as welding or cutting. At least one (1) extinguisher per unit.

The above requirements are the minimum. The actual quantity of extinguishers required will be based on the character of fire anticipated and the units of extinguishing potential necessary to protect the particular property or area.

The location of all fire extinguishers will be conspicuously marked, especially in large areas. They will not be obscured by stock, equipment or partitions, etc.

A marked-up drawing will be kept on file showing the locations of all fire extinguishers. Each location will have its own identification number.

7.11.4 Inspections and Discharging

All fire extinguishers will be kept in a serviceable condition. They will be inspected monthly to check for serviceability and damages. An inspection log will be kept on file. Each extinguisher will have its own identification number. Damaged or undercharged extinguishers will be replaced immediately.

A report will be completed each time an extinguisher has been discharged.

7.12 Use of Pneumatic Tools and Compressed Air

7.12.1 General

Pneumatic tools will be operated and maintained in accordance with the manufacturer's specifications.

Air-powered tools will only be connected to a safe compressed air source. They will NEVER be connected to nitrogen or compressed air.

Before using pneumatic tools, the hose, connections and tool will be checked for proper operability. Before connecting the tool to the hose, the hose will be pointed in a safe direction and blown out to remove moisture and dirt.

Hose couplings will be secured with the manufacturer's recommended ("whip check") devices (or wire-tied) to prevent them from detaching and whipping around.

Compressed air will only be used to blow debris from an area if a Safe Work Permit has been obtained, the area has been clearly demarcated, and all other personnel are at a safe distance.

Compressed air will not be used to blow off clothing.

Tool switches will be of the "dead man" type. Lock-on switches/pins will be deactivated or removed.

Before changing tools, the pressure will be turned off and the hose pressure removed through use of the tool. Hoses will never be kinked to stop air flow.

The supply pressure will always be turned off when not in use.

Safety glasses and a face shield will be used with pneumatic tools such as chippers and other tools that produce flying particles.

Hearing protection will be used to suit the task.

7.13 Chemical/Hazardous Materials Information

Chemical/Hazardous Materials Information is provided in Volume 2 - Part 2F: Hazardous Materials Management Plan.

7.14 Common OHS Hazards

7.14.1 General

The work place can pose many health hazards. Some common occupational health and safety hazards found in the construction industry environment are included below. Project personnel must remain aware of these aspects of occupational health and safety, and implement preventive/corrective measures to provide required protection for their workers.

- Oxygen deficiency, or noxious gases in confined spaces;
- Carbon monoxide exposure caused by engines running inside enclosures;
- Toxic gas emissions caused by use of fuel-fired heaters with inadequate ventilation;
- Release of solvent vapors while using waterproof glues and paints;
- Inhalation of, or skin contact with, paints, varnishes and coatings particularly those which are urethane or epoxy-based;
- Inhalation of hazardous dusts occurring from sand-blasting and rock-drilling activities;
- Exposure to airborne zinc (symptoms of "Metal Fume Fever") caused by cutting or burning galvanized metal;
- Chemical burns caused by skin contacts with lime, wet concrete, cement products and acids;
- Noise-induced hearing loss caused by worker exposure to prolonged excessive noise;
- Poor air quality, complicated by temporary construction enclosures (proper planning and consideration of equipment types, enclosure size, air changes and ventilation will prevent most air quality problems); and
- Potential injury incurred from a load shifting on a truck during transit, and collapsing when the tie-downs are released.

7.15 Housekeeping

In order to provide a safe and productive workplace for all workers, it is essential to recognize the importance of good housekeeping practices in their areas of work.

Project personnel are responsible for ensuring that their work and laydown areas are maintained in an orderly fashion and free of debris at all times. WMMC reserves the right to maintain good housekeeping by cleaning up the Contractor's work area and back-charging for the service.

Floors, platforms, stairs and walkways will be kept free of loose materials at all times.

All equipment, tools and materials used on the site will be removed from the work area and returned to the proper storage area upon completion of each job.

Garbage, material, or tools will not be permitted to be thrown from elevations and will be lowered in containers or special chutes.

Materials will be well-secured, especially at elevations, to avoid movement during windy conditions.

Areas in the proximity of emergency equipment, such as fire extinguishers, hoses, and emergency PPE, will be kept clear at all times.

Hoses, cables and cords will be kept in an orderly manner to prevent tripping hazards. Electrical and welding cables will not be allowed to lie in pools of water. Where possible, cables will be suspended above the ground, or will be protected from mechanical damage if they cannot be suspended. Unused hoses and cables will be rolled up and stored. Unless cables and hoses remain in an orderly manner, they will be rolled up on a frequent basis as determined by WMMC.

Oily rags will be disposed in closed metal containers, not with other garbage.

Hydrocarbons or chemicals will not be intentionally spilled onto the ground or into a sewer system. Spills will be reported and cleaned up immediately.

Rubbish, debris, and other materials will not be permitted to blow around freely. Daily clean-ups will be performed to collect all wind-blown materials.

7.16 Identification of Hazards

7.16.1 Purpose

The purpose of this practice is to establish the general requirements for the installation of barricades, flagging and identification signs.

7.16.2 Barricades

Barricades will be used as a physical barrier to prevent employees from coming into contact with a hazard. Barricades may be portable wood types, posts and temporary fencing, or posts and ropes.

Barricades will be of a fixed nature that can restrain employees when used in situations where crossing the barricade poses an immediate and serious hazard to employees.

7.16.3 Flagging

Flagging tape is used as a warning to employees of hazards that exist in work areas. There are three types of flagging that are generally used:

Red (“Danger - Do Not Enter”): This type of flagging is used where there is danger of an imminent hazard such as falling objects. Only those personnel involved in the work and aware of the hazards are allowed in these areas.

Yellow (“Caution”): This type of flagging provides a warning that a hazard exists in the area. Employees can enter the area only when they haveafter checking and knowing the hazard.

Personnel using flagging will:

- Flag-off only the areas where the hazard exists (flagging-off too large an area interferes with other work);
- Remove the flagging when complete, and recover it for further use;
- Use the appropriate type of flagging for the hazard. Check with the supervisor for the installation of red "Danger - Do Not Enter";
- Identify all projected objects or guy wires with high-visibility markings/flagging;
- Identify all oversize, over-dimensional loads with high-visibility flagging on the front and rear corners and on both sides of the load; and
- Tag all flagging with the date, reason, and p, identifying name, date and reason for use.

7.16.4 Signs

Warning signs will be used to indicate specific hazards (e.g., “Danger - Overhead High Voltage”, “Slow-Moving Vehicle”, “Oversize Load”, etc.).

7.16.5 Flashing Lights

Flashing lights are used to bring attention to hazards during periods of darkness, poor visibility, or to attract attention to a specific hazard. Flashing lights will be used:

- For slow-moving, wide or long loads; and
- To identify temporary obstructions in roadways.

7.17 Project Equipment and Tool Maintenance

7.17.1 Intent

All Project equipment will be operated, maintained, inspected, and tested using systems and procedures that manage OHS risks. This standard is applied and mandatory for all work activities, and the WMMC Project Management Team will approve all operation and maintenance procedures prior to the mobilization of equipment.

7.17.2 Performance Requirements

- The contractor will establish and maintain procedures to ensure that construction and maintenance activities are managed to minimize OHS risks and impacts. These systems and procedures will be documented where their absence resulted in deviation from the planned activities and manufacturers’ recommendations.
- WMMC will review the procedures regularly to ensure that they continue to be applicable, relevant, and effective in controlling the hazards for which they were prepared.
- WMMC will measure, monitor, analyze, review, and, where the procedure has been modified due to design, make changes in the procedures to reflect the risk reduction methods;
- Critical equipment, systems, procedures and activities will be identified and documented. As a minimum, quarterly inspections will be conducted.
- Risks introduced by simultaneous operations will be assessed and managed by the contractor.
- Systems will be established, documented and maintained to ensure the ongoing integrity of equipment. These include maintenance, inspection, testing, calibration and certification of equipment at frequencies appropriate for the

level of risk associated with the equipment and manufacturers' requirements. Certifications, by a third party agency, are to be conducted on all heavy equipment prior to being allowed on-site and annually thereafter.

- All equipment that is mobilized at the Project area, or is out of service for maintenance or modification, is subject to documented inspection and testing prior to use to ensure that operational integrity and safety of the operator and all personnel on the Project is maintained.
- Equipment or tools damaged on-site or involved in an incident will be quarantined and re-inspected or certified prior to being re-used on the Project.

7.18 Documentation and Record Keeping

7.18.1 Scope

WMMC site management and Contractors have a responsibility to ensure that records relevant to this OHSP and to the verification of compliance to Mongolian laws, regulations, codes, standards are properly maintained and readily accessible at the Project area.

7.18.2 Definition

An occupational health and safety record is a document that provides written or electronic evidence that a given activity/action has occurred. A document may come in the form of a letter, memo, report, health and safety meeting minutes, a log or a form.

7.18.3 Responsibility

The WMMC ESHS Manager will:

- Ensure that the following list of electronic or hard copy record-keeping documents is maintained at the Project area;
- Retain all records until the Project is completed and upon completion of the Project, all documents will be boxed and sent to the archive at the business unit office;
- Administer the health and safety record-keeping system; and
- Regularly audit health and safety records to ensure compliance with established requirements.

Other WMMC On-Site Management and the Contractor will:

- Maintain records in accordance with this procedure and local jurisdictional requirements;
- Maintain pre-mobilization and equipment inspection records; and
- Forward required records to the WMMC ESHS Manager.

7.18.4 General OHS Recordkeeping Requirements

The Project establishes OHS record-keeping requirements. Records will be stored and maintained in a readily retrievable manner and protected against damage, deterioration, or loss. Due to the confidential nature of the material (e.g., medical records), certain records will be stored in a secured area.

The WMMC ESHS Manager will determine a record retention policy (e.g., how long specific records must be maintained). As a rule, all records will be maintained until the end of the Project, at which time, they will be boxed and transferred to secure, inactive storage. All file boxes will be labeled to identify contents and will include a destruction date, if applicable.

In the case of inspections, investigations, and meeting minutes, records must include follow-up on identified corrective actions.

7.18.5 WMMC and Contractor Project Specific Recordkeeping Requirements

As a minimum, the OHS record-keeping system will contain the following records:

- Planned Inspection Reports (complete with follow-up);
- Informal Inspection Reports;
- Pre-Use Equipment Checklists;
- Documentation of Inspections by Regulatory Agencies;
- Pre-Mobilization Equipment Inspections;
- External Inspections and Audits;
- Accident Statistics;
- Accident/Incident Investigation Reports and associated documentation;
- Project Safety Management Meeting Minutes;
- Safety Orientation Training Delivery;
- Training Records/ Attendees / Courses;
- Safe Handling of Chemicals (Workplace Hazardous Materials Information System [WHMIS], Hazard Communication [HazCom], equivalent subject);
- Record of administered disciplinary action;
- Record of training associated with specialized PPE;
- Safety Alerts and Posting;
- Emergency Response Plan;
- Occupational Health Services documentation;
- Fitness for Duty documentation issued by the doctor;
- Health Services and health and safety staff qualifications and training records;

- Medical Treatment protocols; and
- MSDS copies of products at the Project area.

7.18.6 Compliance Monitoring

To verify that records are being maintained in accordance with established requirements, spot audits will be done by the ESHS Manager or designate.

7.18.7 Documentation Requirements

All WMMC and Contractor personnel are required to comply with the above document requirements. Final disposition (destruction or permanent retention in an archive) of all records will be determined by senior management.

Appendix A

A.1 Excavating, Trenching, and Shoring Safety

A.1.1 General

- No person will enter or be permitted to enter any excavation that does not comply with the requirements of the governing OHS Regulations for the region.
- "Excavation" means any dug-out area of ground.
- "Trench" means an excavation where the excavation depth from the highest point of the excavation wall to a point level with the lowest point of the excavation, exceeds the excavation width (width equals the least horizontal dimension between the two (2) opposite walls of the excavation).
- Where required by legislation, no worker will enter a deep trench (depth as specified in the applicable legislation) unless the relevant authority has been notified and grants approval/variance in writing prior to mobilization.
- Work will not be performed in a trench unless another worker is working above ground in close proximity to the trench.
- Every excavation that a worker may be required to enter will be kept reasonably free of water.
- There will be a space of at least 450 millimeters between the wall of an excavation and any formwork or wall inside the excavation, if a worker may be required to enter.
- All precautions will be taken to prevent rock, sand, or other materials from entering an excavation.
- A level area extending at least one meter from the upper edge of each wall of an excavation will be kept clear of equipment, excavated soil, rock and construction material.
- No person will operate or park any vehicle in such a way to affect the stability of an excavation.

A.1.2 Slope Requirement and Protective Structures

Excavations and trenches deeper than 1.5 meters that require entry by workers will:

- Slope the walls to the minimum gradient as specified in the applicable legislation (except where cut in sound, stable rock);
- Provide a support structure that will protect the workers;

- When between 1.5 and 3 meters in depth, be shored in accordance with prevailing legislation, or the walls inspected to ensure sufficient stability, thus not endangering the workers; and
- When deeper than 3 meters, be constructed and installed in accordance with the specifications of a Professional Engineer.

A.1.3 Barricades/Warnings

Barricades, warning of the danger, will be installed around the excavation as long as the hole is open. These will be designed in such a manner that personnel cannot fall into the hole without extricating themselves.

The Contractor's OHSP will include the allocation of personnel and equipment to execute a rescue should it be required.

Backhoes or other mechanical excavation equipment will not excavate in such a manner as to risk undermining their ground support.

A.2 Operation And Inspection Of Cranes And Hoists

A.2.1 General

All persons employed as operators of cranes and hoisting equipment will be checked by the appropriate supervisor for proficiency in the operation of cranes and hoists. The appropriate supervisor will review the proficiency and knowledge of operators when assigning work on specific equipment.

No worker will operate a crane or similar hoisting device unless the worker has the appropriate training and experience and is certified in accordance with Mongolian regulations.

All cranes and hoists will be operated, tested and maintained in accordance with the manufacturer's specifications.

A.2.2 Inspections, Testing, and Logbooks

The owner of a crane or similar hoisting device will keep a permanent record of the full history of all inspections, tests, repairs, modifications and maintenance of each crane or hoisting device. These will be made available upon request.

Each crane or hoisting device will be load tested, and will have all structural components including, boom, hoist/hook assembly inspected and certified at least once every twelve months by a certified quality control company and in accordance with Mongolian laws and regulations.

Each crane or hoisting device at the Project area will at all times have its own logbook that will include all inspections, tests (including load and nondestructive examinations), repairs, modifications, rope changes, and maintenance for the immediate preceding twelve months prior to first use at the site - and for the entire period that the crane or hoisting device is on the site. No crane or hoisting device will be permitted at the Project area without such a logbook.

Cranes that enter and leave the Project area/facility on frequent short-term assignments will be certified initially, and then every six months thereafter.

Whenever sudden and unusual shock loads are applied to a crane or hoisting device, it will be removed from service immediately and will be subjected to complete inspection, testing and certification by a third party agency prior to work as determined by the ESHS Manager.

A.2.3 Operation

The operator of a crane or hoisting device will:

- Familiarize himself/herself with the equipment and its proper care;
- Perform and log a "Daily Crane Safety Inspection" on electrical, pneumatic, cooling, mechanical, hydraulic, suspension, structural, and safety devices on a frequent basis in accordance with the manufacturer's requirements;
- Test all controls at the start of each shift (if any functions do not operate properly, they will be repaired before any operations begin);
- Notify the next operator of any defects upon changing shifts;
- Be responsible for those operations under his/her direct control (whenever there is any doubt as to safety, the crane will not operate until safety has been assured);
- Not close the switch or start the engine if a warning sign is on the switch or engine starting controls until the warning sign has been removed by the person placing it there;
- Know that the weight of the load to be lifted is within the capacity of the machine;
- Not engage in any practice which will divert attention from the operation of the machine;
- Either have a clear and unrestricted view of the load and the operational area or act upon the instruction of the appointed signaler;
- Not hoist any equipment or load until safe working conditions have been assured, or orders to proceed have been issued by the appointed signalman;
- Respond to signals only from the appointed signaler but obey a STOP signal at any time no matter who gives it; and
- Not leave his/her position at the controls while a load is suspended.

If the power fails during operation, the operator will immediately set all brakes and locking devices, and communicate with the individual in charge. If practical, a suspended load will be landed under brake control.

Before leaving the machine unattended, the operator will, insofar as practical:

- Land any attached load;
- Ensure the boom is not left suspended over the operating plant;
- Tieback the hook to the crane;
- Set all brakes and locking devices;
- Secure the unit against accidental travel and inadvertent movement; and
- Lock the doors to prevent unauthorized access.

When a high wind warning is issued, the crane will be completely secured. On cranes with hydraulic booms, the boom will be fully retracted.

When lifting/moving loads, the operator will:

- Ensure the load is kept under control at all times and, when necessary, one or more guide ropes or tag lines will be used to prevent the rotation or other uncontrolled motion of the load. The length of the tag line will be sufficient to ensure that the worker controlling the tag line cannot be struck by any movement of the load;
- Ensure loads are not hoisted when uninvolved workers are within range of the fall envelope; and
- Ensure that the manufacturer's lifting beams are plainly marked with their weight and designed working loads, or that they have an engineer's certificate on file.
- Ensure that operators, riggers and supervisors are thoroughly familiar with the limitations of the equipment.

A.2.4 Obstructed Vision

Whenever the operator has his vision obstructed, a single competent signaller will be stationed:

- In full view of the operator, and
- With a full view of the intended path of travel of the equipment, load or components, yet clear of the intended path of travel.

The signaller will assist the operator by keeping the obstructed part of the equipment under observation and, when it is out of view of the operator, by communicating with the operator by the use of visual signals or a suitable radio communication system.

The signaller will:

- Be fully qualified and competent;
- Wear high visibility gloves or vest; and
- Use hand signals only when conditions are such that his/her signals are clearly visible to the operator (the signaller will review the signals prior to starting the operation), otherwise use radio communication.

A.2.5 Traveling with a Load

Extreme caution will be exercised when a crane is traveling with a load, and the following precautions will be taken.

- The traveling procedures will be in accordance with the manufacturer's recommendations.
- Ground irregularities will subject the carder, boom, and suspension to additional shock loads, which will be compensated for by reducing the hook load, or by leveling the ground.
- Negotiation of slopes by cranes traveling with suspended loads will be avoided;
- The boom will generally be carded in line with the direction of motion.
- Where permitted by the design, the crane operator will remain in the crane cab to control the load and a second operator will be used to drive the vehicle. The signaler (with the assistance of others, if required) will coordinate the operation, walk ahead of the load, and warn of hazards.
- The load will be kept as close to the ground as possible such that the length of hoisting cable between the boom point and load is as great as possible.
- The crane will be snubbed to prevent it from running away if the clutch or brakes fail on steep slopes or in hazardous conditions.
- Care and awareness when approaching sub-grade structures (culverts, etc.) will be required to ensure that any structure's supporting capacity is not exceeded.

A.2.6 Lift Program

Information regarding loads, vessels, skid units, etc., will be compiled early in the Project's planning stages to allow adequate time to arrange for any required lift studies. Timely completion of lift studies will ensure sufficient time to procure the necessary lifting and hoisting equipment and will establish a schedule that will maximize the safety component of such lifting procedures.

Some factors to be considered in scheduling the lifts and determining the required equipment include:

- Scheduled arrival dates/times of equipment;
- Location and condition of lay down areas;
- Stability and grade of area soil/surface;
- Existence and capacity of sub-grade structures (culverts, etc.);
- Size, weight and configurations of equipment;
- Placement of equipment;
- Access, egress and working area of hoisting equipment;
- Number and lifting capacities of hoisting equipment readily available;
- Completed study of all lifts; and
- All safety requirements and procedures.

A.2.7 Critical Lifts and Rigging Studies

The Contractor will ensure that the appropriate WMMC personnel are consistently informed, in a timely fashion, as to the status of all lifting that will occur at the Project area. Under no circumstances will hoisting take place without prior knowledge and expressed approval of the WMMC On-Site Manager.

A.2.8 Critical Lift Study

The completed critical lift study is the responsibility of the Contractor. The study may be completed using in-house expertise or it may be completed by a Sub-Contract Rigging Specialist or by another competent party.

Lifts, as defined hereunder, will not take place without a review meeting with WMMC, and will require Lift Study Drawings and/or Lift Calculation Forms as specified in **Table 3**.

Table 3 Lift Form/Drawing Requirements

Specifications	Lift Calculation Form	Lift Study Drawing
a) All lifts greater than 70 percent, but less than 90 percent of rated capacity for boom length and radius combination	Yes*	No
b) All lifts over 90 percent of rated capacity for the boom length and radius combination	Yes	Yes
c) All lifts in excess of 15 tons	Yes	Yes
d) All lifts that require two (2) or more cranes or hoisting devices (e.g., tandem lifts)	Yes	Yes
e) All lifts that require special fabricated attachments such as spreaders, lifting beams, or personnel baskets	Yes	Yes
f) All lifts required to be hoisted over process equipment or buildings in which people reside	Yes	Yes

* When multiple lifts are done from the same position, then only one lift calculation form is required - using the highest loading condition of weight and radius, provided 70 percent of the rated capacity is not exceeded.

The following information will be shown on the lift study drawing:

- Detailed dimensioned rigging hook-up diagrams for each hook, showing details of hook, rigging, and lifting lugs;
- A plot plan and elevations showing crane positions, pick positions, placement positions, existing equipment, gravel and wooden mats, etc.;
- Detailed step-by-step written procedures, showing the sequence of events;
- A data table indicating the details and configuration of cranes, maximum and minimum boom lengths, boom angles, maximum and minimum radii, wire rope type and size, counterweight, etc.;
- A data table indicating the details of the equipment to be lifted, including size, weight, center of gravity, and equipment number;
- Any special notes, including the maximum allowable wind speed (32 kilometers per hour unless otherwise noted), special ground compaction requirements, etc.;
- Positions of permanent and temporary equipment and foundations (including those that must be left out to facilitate the lift); and
- Access routes for cranes and transport vehicles.

All lift studies will be signed by a qualified person as determined by Mongolian law and WMMC.

A.3 Use and Inspection of Rigging

A.3.1 General

This procedure applies to all rigging equipment, including wire rope and slings, chains, synthetic (polyester/kevlar/nylon) slings, lever hoists (come-alongs), chain falls, tirsors, shackles, hooks, lifting/spreader bars, clamps, and any other load-bearing hoisting attachment. Refer to "B.7 Operation and Inspection of Cranes and Hoists" for the procedure that applies to cranes and hoists.

The safe working loads on rigging will be based on a 5-to-1 safety factor. The safety factor will be increased if there is any possibility of injury or death due to failure of the rigging.

The working loads of rigging will not exceed the safe limits established by the manufacturer. Any rigging that has been fabricated will be designed and certified by a Professional Engineer, and will have the safe working load clearly stamped on it.

All rigging equipment will be permanently identified with the safe working load and unique serial number.

A.3.2 Inspection

Rigging equipment will be inspected by journeymen experienced in rigging a minimum of once per month, but more frequently (weekly or even daily) if used continuously. Damaged rigging equipment will be removed from service and destroyed.

An inspection log will be maintained for all rigging equipment. Manufacturer's recommendations regarding criteria that necessitate repair or replacement will be followed.

A.3.3 Slings and Wire Ropes

Sharp edges of loads will be protected with wood softeners or other soft material to protect the slings.

Wire ropes and slings will be inspected for corrosion, kinks, abrasion, electric arcing, metal fatigue, bird caging, diameter reduction and broken strands.

Synthetic slings will be inspected for evidence of exposure to heat, cuts or frays, or for indications of wear (internal or external).

A.3.4 Chains

The use of chains will be avoided if wire rope may be used instead. Chains usually give no warning when they are about to fail, whereas wire ropes will normally fail progressively, and frequent inspections will detect damages.

Chains will be inspected for wear, deformation, cracks, or stretch (against a new chain with a master link kept for this purpose).

A.3.5 Come-Alongs and Chainfalls

The chain will not be wrapped around the load for hoisting.

Come-alongs and chainfalls will not be overloaded. The average pull required on a standard come-along handle or chainfall chain varies between 20 and 45 kilograms, and the application of excessive leverage or weight will overload the equipment. Even the body weight of one person hanging from the lever or chain is a sign of overloading. Only one person will pull the chain or operate the lever at a time.

“Cheaters” or handle extensions will not be used on come-alongs to provide more leverage.

A.3.6 Hooks and Shackles

All hooks will be made from forged steel with the safety rating stamped on it, and will have working safety catches.

Shackles will not be used in such a manner that the rope can run over the screw pin. The screw pin will seat fully into the body, and bolts will not be used to replace missing pins.

A.3.7 High Lines

The use of high lines is not permitted. A high line is a method used to position a piece of equipment that is not accessible by crane (usually inside a building or structural enclosure). High lines consist of lashing wrapped around two building members and a wire rope pulled tight between them (a snatch block on the lashing is then used to lift the load and move it laterally).

A.4 Crane Suspended Worker's Basket

A.4.1 Scope

Personnel baskets will only be used when conventional methods of access cannot be used due to the site configuration or conditions, or specific hazards. All crane-suspended personnel baskets will be used and maintained in full compliance with applicable legislation.

A.4.2 Design and Construction of Personnel Basket

The basket will meet the following requirements:

- Be designed by a Professional Engineer in accordance with good engineering practice. A signed, stamped drawing will be provided, showing empty weight, maximum-rated load capacity, maximum number of people, and serial number;
- Be constructed by a certified welder, with a design safety factor of 10;
- Have all rigging components with a minimum safety factor of 10;
- Be of a box design, having the lifting points in the top four corners and enabling the workers to stand upright with sufficient headroom;
- Have a bridle sling arrangement that evenly distributes the weight between each sling and prevents tipping. The bridle sling and other rigging attachments will be a permanent part of the basket and will not be used for other purposes;
- Have a handrail 1,070 millimeters from the floor and a mid-rail halfway between the handrail and floor;
- Have a toe board 100 millimeters high;
- Have solid material or expanded metal (with 13-millimeter maximum openings) below the handrails;
- Have an inward opening gate with a positive closing latch;
- Have a solid non-slip floor with stiffeners on the underside and some appropriate method of allowing water runoff;
- Have anchor points for worker's fall arrest systems above the headache ball or other attachment;
- Have a grab rail inside the handrail to minimize hand exposure;
- Have the empty weight, maximum-rated load capacity, maximum number of people, and a unique serial number legibly and permanently marked in a conspicuous place on it;
- Be painted in a high visibility yellow color;
- Have a safety wire rope sling attached to the basket at a separate location from the primary point of suspension. The other end of the safety line will be attached above the ball or above the hook on the block;
- Be certified every 12 months;
- Not be used as a materials hoist; and

- If shackles are used as part of the arrangement, ensure that they are cotter-pinned or housed to prevent "turn-out".

A.4.3 Crane Set-up

The crane will:

- Be inspected by a competent Professional Engineer (who will be aware of the purpose of the inspection) before use for the first time, and every twelve months thereafter;
- Be set up within one percent of level grade and located on firm footing;
- Have all outriggers and pads in use as specified by the manufacturer;
- Have an anti-two-block device fitted;
- Have a positive locking latch fitted to the hook that is in good working order;
- Not be loaded in excess of 75 percent of its maximum rated load capacity at the boom angle and radius configuration. Hoisting and lowering speeds will be under power and will not exceed 30 meters per minute;
- Have a braking system that engages automatically in the event of an engine failure; and
- Have a load monitoring device to verify the lift weights.

Trial lifts with the empty basket will be made to the location where the basket will be positioned, and repeated each time the crane is repositioned, and at the start of each shift.

The crane operator will remain with the crane at all times, with the engine running, while personnel are suspended in the basket. No other loads may be combined with the basket.

A.4.4 Permits and Operation

A permit and lift calculation form is required each time the basket is used. Multiple lifts from the same crane in the same position only requires one permit, although a new permit is required at the start of each shift. A copy of the permit and lift calculation will be kept by the crane operator.

The following will also apply:

- A competent worker will inspect the crane's structural elements and the rigging for defects before each use of the crane;
- Every worker involved in the operation will receive adequate instructions about the requirements, restrictions, hazards, and emergency rescue procedures associated with the hoisting operation at a pre-lift meeting;
- Radio communication will be maintained between workers in the basket, the crane operator, and the foreman. Radios will have fully charged battery units at

the start of hoisting. Hand signals will be used in case of emergency and will be verified before hoisting commences;

- Workers will keep all parts of their bodies within the basket when it is being raised and lowered;
- Tag lines will be used for all lifts, except where their use constitutes a hazard;
- No hoisting will take place during high winds, lightning, or other adverse weather conditions;
- No hoisting will take place near energized electric wires if exceeding the recommended closest approach guidelines found elsewhere in this OHSP;
- All workers will wear a fall arrest system attached to the proper anchor points as appropriate; and
- The basket will be secured to the structure if workers exit it at an elevated position.

A.5 Pressure Testing

A.5.1 General

Prior to a Contractor undertaking any hydrostatic testing, a thorough review of the Project-specific pipe testing specification will be completed and a testing plan will have been written by a Professional Engineer outlining the following:

- Test medium (water or water/ethylene glycol mixture);
- Maximum test pressures, taking into account pressure increases due to thermal expansion and static pressure;
- Blanking required to isolate other vessels or lines from the system to be tested;
- Water supply point and drainage point; and
- Testing equipment to be utilized.

Appropriate officials with jurisdiction over the construction of the facility will also have been notified as to the testing procedures and timing. Testing will not be performed against closed valves or check valves. Testing with expandable gases (e.g., compressed air) will not be permitted without an approved testing plan.

Piping and vessels that have foundations and supports that are not designed to support the weight of the system with the test medium will be supported temporarily in an adequate manner prior to filling with the medium.

A.6 Temporary Gas Installations

A.6.1 General

The prevailing legislated Code/Standard will be used as a minimum standard.

A.6.2 Permits

All necessary permits will be obtained prior to any gas hook up. The permit holder is responsible for supervising and inspecting all installations under the permit. Copies of all permits will remain at the Project area and made available on request.

A.6.3 Installations

All temporary gas installations will be done by journeyman gas fitters whose qualifications are recognized by the territorial jurisdiction.

A.6.4 Cylinders, Tanks, and Vaporizers

All references to cylinder/tank capacity in gallons refers to US water gallons.

All propane cylinders or tanks with a capacity of 123 gallons or greater will be identified with a weather-proof tag indicating:

- Company name;
- Cylinder/tank number; and
- Contact person and phone number.

Tanks will be tagged to ensure that responsible parties can be contacted in the event of an emergency, or if there are problems with the installation.

All cylinders, tanks and vaporizers will be placed on a solid base that eliminates direct contact with the ground. Bases for cylinders and tanks with a capacity greater than 123 gallons will be non-combustible material.

1,000-gallon tanks will be located at least 8.5 meters from buildings and combustible materials.

A.7 Identification of Hazards

A.7.1 Purpose

The purpose of this practice is to establish the general requirements for the installation of barricades, flagging and identification signs.

A.7.2 Barricades

Barricades will be used as a physical barrier to prevent employees from coming into contact with a hazard. Barricades may be portable wood types, posts and temporary fencing, or posts and ropes.

Barricades will be of a fixed nature that can restrain employees when used in situations where crossing the barricade poses an immediate and serious hazard to employees.

A.7.3 Flagging

Flagging tape is used as a warning to employees of hazards that exist in work areas. There are three types of flagging that are generally used:

Red (“Danger - Do Not Enter”): This type of flagging is used where there is danger of an imminent hazard such as falling objects. Only those personnel involved in the work and aware of the hazards are allowed in these areas.

Yellow (“Caution”): This type of flagging provides a warning that a hazard exists in the area. Employees can enter the area only after checking and knowing the hazard.

Personnel using flagging will:

- Flag-off only the areas where the hazard exists (flagging-off too large an area interferes with other work);
- Remove the flagging when complete, and recover it for further use;
- Use the appropriate type of flagging for the hazard. Check with the supervisor for the installation of red “Danger - Do Not Enter”;
- Identify all projected objects or guy wires with high-visibility markings/flagging;
- Identify all oversize, over-dimensional loads with high-visibility flagging on the front and rear corners and on both sides of the load; and
- Tag all flagging with the date, reason, and personnel associated with its use.

A.7.4 Signs

Warning signs will be used to indicate specific hazards (e.g., “Danger - Overhead High Voltage”, “Slow-Moving Vehicle”, “Oversize Load”, etc.).

A.7.5 Flashing Lights

Flashing lights are used to bring attention to hazards during periods of darkness, poor visibility, or to attract attention to a specific hazard. Flashing lights will be used:

- For slow-moving, wide or long loads; and
- To identify temporary obstructions in roadways.

Emergency Response Plan
Social and Environmental
Management and Monitoring Program

Big Bend Placer Gold Mining Project



Prepared for



WM Mining Company, LLC
Centennial, Colorado, USA

Prepared by



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List of Abbreviations and Acronyms

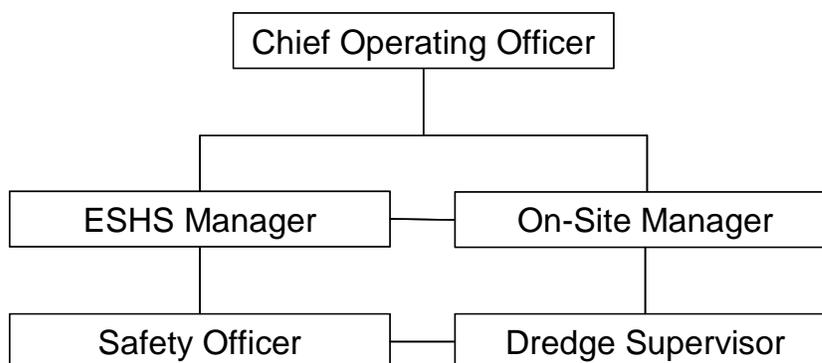
°C	degrees Celsius
µg/L	micrograms per liter
µg/m ³	micrograms per cubic meter
ACGIH	American Conference of Governmental Industrial Hygienists
APCC	Accident Prevention, Control, and Countermeasures
APPEL	United Nations Environment Programme Awareness and Preparedness for Emergencies at the Local Level
COO	Chief Operating Officer
CPR	Cardio Pulmonary Resuscitation
dB	decibel
dBA	A-weighted sound pressure level
dBC	C-weighted sound pressure level
EDTA	edetic acid
EMT	emergency medical technician
ESHS	environmental, social, health and safety
GIIPs	Good International Industry Practices
HazCom	hazard communication
Lux	Minimum Average Illumination
MLL	Mongolian Law on Labor
MSDS	Material Safety Data Sheets
MSHA	Mine Safety and Health Administration
NTA	nitrilotriacetic acid
NTUs	nephelometric turbidity units
PM	particulate matter
PPE	Personal Protective Equipment
SCBAs	self-contained breathing Apparatuses
TCUs	true color units
US	United States
WHO	World Health Organization

1.0 Introduction

This document outlines the **Emergency Response Plan** for the Big Bend Placer Gold Mining Project, along with General Health and Safety Program components. Emergency plans, organizational responsibilities, reporting procedures, specific plans for responding to emergencies and emergency response training are also covered in detail. Stipulations in the World Bank/IFC Environment, Health and Safety Guidelines for Mining will be followed in addition to Good International Industry Practices (GIIPs).

2.0 Organization and Management Responsibilities

The organization of the emergency response management is shown in the chart below. The responsibilities of each position are further described in the following.



2.1 Chief Operating Officer (COO)

The COO will oversee the overall Project activities. This position will be located in Ulaanbaatar. The COO will be ultimately responsible for emergency preparation and ensuring that the response plan is in place and ready to be implemented. The COO will be directly involved in permitting and compliance, as well as social and environmental management.

2.2 On-Site Manager

The On-Site Manager will oversee all of the operations at the Project area. This person will be responsible for ensuring that the Mine Camp and mess hall operations run well, that the Mine Camp is properly supplied, and that diesel fuel and lube are adequate for mine operations. This person will supervise the

activities of the Mine Camp and workshop staff as well as oversee the tasks of the security officers and the Environmental, Social, Health and Safety Manager (ESHS) Manager. The On-Site Manager will supervise all mining operations in the field. The On-Site Manager will be responsible for ensuring that the appropriate Emergency Response Plan is implemented for incidents at the Project area. The On-Site Manager will report to the COO in Ulaanbaatar and coordinate with the Office Manager in Ulaanbaatar for day-to-day operations. During emergencies, this person will be the primary coordinator at the Project area.

2.3 Environmental, Social, Health and Safety Manager

The ESHS Manager will be present at the Project area to coordinate environmental protection activities and to oversee any safety issues. This person will ensure sufficient medical/emergency supplies and transportation are available to respond to any emergency. During emergencies, the ESHS Manager will assist the On-Site Manager in implementing the Emergency Response Plan.

2.4 Dredge Supervisor

The Dredge Supervisor will oversee all dredging and processing operations in the field. This person will be assisted by a geologist to ensure that dredging operations will run smoothly. The overall direction of field operations will be coordinated with the Chief Geologist. The first person on the scene of an accident will contact the Dredge Supervisor and the Safety Officer (defined below) to report the incident. The Dredge Supervisor will then implement the appropriate response and report to the ESHS Manager and the On-Site Manager.

2.5 Safety Officer

One person at each dredge and floating process plant will be the Safety Officer, who will be responsible for all safety issues during that shift. The individual Safety Officers will work with the ESHS Manager to ensure that all health and safety requirements are met. The Safety Officer will be responsible for ensuring that the Emergency Response Plan is implemented at the assigned dredge.

2.6 Contact List

An emergency contact list will be developed once communications are in place. The list will contain all telephone numbers (work and home) for the key officers and managers, as well as contact information for the police, medical services, and government officials. A copy of the list will be made available at every office

desk and emergency station. In the field, communications will be handled via two-way radios.

2.7 Emergency Equipment Location

The location of first aid kits, fire extinguishers, protective clothing, etc. and any emergency equipment will be clearly marked on a layout of the dredge. Layouts will be clearly posted at strategic locations on the dredges and associated floating process plant, and distributed at the safety meetings as necessary. Emergency response vehicles will be parked at the road closest to the active dredge pond. A copy of the **Emergency Response Plan** will also be posted at the locations where they may be needed.

3.0 Communications

3.1 Internal Communications

All managers and supervisors are required to enforce Company rules and policies at all times. Weekly meetings will be held in the field, and a copy of the minutes will be sent to the Head Office. Part of the meetings will cover various emergency response topics. In addition, weekly safety reports and actions are to be prepared and submitted to the COO. Periodic inspections and audits will be made of all Company activities. In addition, Incident Reports are to be made as soon as an incident occurs (spills, accidents, dredge operation failure, security breach, etc.). A recommendation for remedial action must be included in the Incident Report, and follow-up reports must include the implementation of the remedial action and its results. A detailed reporting scheme, follow-up and record keeping will be prepared prior to the start of operations.

3.2 Communications during an Emergency

During an emergency at the dredge or floating process plant, the Dredge Supervisor will immediately contact the On-Site Manager and provide a detailed report on the nature of the emergency and the responses that have been taken. The Mine Manager will ensure that all appropriate measures are taken, then contact the COO.

In the case of an emergency at the Mine Camp, workshop, or other areas other than at the dredge or floating process plant, the On-Site Manager will contact the COO in Ulaanbaatar.

3.3 Communications with the Public

All accidents will be reported to the local police and appropriate government agencies, as required by law. All communications regarding an emergency will be communicated to the public only upon the decision of the COO. This includes press releases, interviews and other types of external communication.

4.0 Accident Prevention, Control, and Countermeasures (APCC)

As Project development begins, an APCC plan will be fully developed, detailing the procedures and guidelines to follow in the event of an accidental chemical spill, sediment escaping to the river, equipment failure, or other emergencies. This APCC plan will cover emergency identification, response, and notification procedures as well as an emergency preparedness plan covering exploratory drilling, materials hauling, on-site facility construction, dredging, and flood evacuation, etc.

In addition, this plan will address the design standards and engineered safety features required at on-site facilities, including spill containment structures at the storage facilities for diesel fuel, hydraulic fluid and lubricant oil. All materials that pose a potential health hazard in the Project area will be listed, and the applicable Material Safety Data Sheets (MSDS) will be provided for each substance. The MSDS will contain information on how to safely handle each substance.

Development of the APCC plan should fulfill the following objectives:

- Identify unplanned scenarios and accidents which might occur given the nature of the proposed facilities;
- Evaluate the probability that such scenarios will occur;
- Predict the environmental consequences of each scenario;
- Identify measures which will reduce the probability that such a scenario will occur (e.g., prevention); and,
- Identify measures which will reduce the environmental impacts of a given scenario should it occur (e.g., control and countermeasures).

The purpose of this plan is to outline policies and procedures for preventing and responding to environmental, health, and safety incidents and emergencies. Some of the general plans include the following.

Daily inspections will be conducted to ensure that workers are equipped and use adequate Personal Protective Equipment (PPE). Field first-aid kits will also be

present with all worker teams, and workers will be briefed in the application of basic first aid. Safety reminders will be posted in prominent locations. Safety briefings will be conducted on a weekly basis and will include planned Project activities and Cardio Pulmonary Resuscitation (CPR) training for all staff.

First-aid kits will also contain snakebite antiserum and epinephrine for reclamation work conducted during the summer months. In addition to a medical evacuation program, an emergency medical technician (EMT) will be on-site in the event of serious injuries requiring hospitalization.

The company will utilize United States (US) Mine Safety and Health Administration (MSHA) tips and safety ideas to assist in the Company's Safety Program (**Appendix 3**).

5.0 Responding to Emergencies

5.1 General Emergency Response Procedures

The focus of Emergency Response Procedures will first and foremost be the preservation of human life, followed by avoiding damage to the environment. The following sections will cover the steps that need to be taken in response to foreseeable emergency situations. Not every situation can be covered, therefore, common sense and good decision-making will still be required. Generally the following priorities should be used without a delay in the reporting responsibility:

- Avoid danger to yourself, others and the environment;
- Prevent further loss of material or damage to equipment if this can be done safely;
- Assess the size and severity of the emergency; and
- Report the emergency to the Security Officer who will contact the ESHS and On-Site Managers.

The first person on the scene will follow the following general approach:

1. Approach accident site cautiously;
2. Identify the hazard(s);
3. Secure the area without entering the accident site if possible;
4. Obtain help; and
5. Decide if site entry would be appropriate (accident or spill site might be too dangerous to approach).

After the initial response, disturbance of accident-related areas should be avoided until the cause of the accident has been determined or until no additional

information can be obtained from the accident related areas. Results of the investigation will be included in the Incident Report, along with recommendations on how to prevent the accident from happening again.

Periodic safety reports not related to safety incidents will include information on occupational injuries and occupational illnesses at the Project area.

5.2 General Emergency Response Checklist (adapted from MSHA)

A. NOTIFICATION

Activate Notification Procedures for Emergency Contacts.

- Notify Medical Support Personnel.
- Notify Fire/Rescue Organizations
- Notify Police
- Notify Key Mine Officials.
- Notify Government Officials.
- Notify Family Members.

B. SHUTDOWN OPERATION

- Assemble Employees.
- Debrief Witnesses.
- Account for All Persons Known to Be at the Mine.
- Assign Employees to Tasks.

C. SECURITY AND SITE MONITORING

- Establish Security - All Access Roads.
- Establish Check-in/Check-out System for All Authorized Persons.
- Assign Site Monitors and Shift Rotation Schedule.
- Establish Parking Area and Staging Area.

D. COMMAND CENTER

- Follow Mine Emergency Response Plan.
- Setup a Mine Emergency Command System.
- Staff Emergency Organization.
- Delegate Authority and Assign Duties.
- Give Appropriate Orders.
- Brief Arriving Personnel.
- Follow Appropriate Safety Precautions.
- Request/Dispatch Additional Persons to Mine as Required.
- Take Appropriate Actions Relative to Site Recovery.

___ Establish a Shift Rotation Schedule for Command Personnel.

E. COMMUNICATIONS

___ Relay Information to the Command Center.

___ Establish External Communications (Corporate, Government, Medical, Legal, Etc.).

___ Monitor and Log All Communications.

F. MEDICAL ARRANGEMENTS

___ Arrange for Ambulance and Medical Services.

___ Setup Temporary Morgue (if required).

G. ACQUISITION OF EQUIPMENT, MATERIALS, AND SERVICES

___ List All Equipment and Materials.

___ Locate and Check On-site Equipment for Possible Use.

___ Arrange for Heavy Equipment if Required.

___ Arrange for Portable Radios.

___ Provide Transportation for Equipment.

___ Obtain Personal Protective Equipment.

___ Establish Press Briefing Area.

H. INFORMATION

___ Appoint a Spokesperson for All Entities.

___ Brief Family Members on a Regular Schedule.

___ Brief the Press and Media on a Regular Schedule

5.3 Accidental Spills and Releases

5.3.1 Fuel and Bulk Oil Storage Facilities and Antifreeze

There will be several diesel and gasoline portable above-ground tanks in place for Project use. Storage facilities will be buried and appropriate safety notices posted (e.g., fire hazard, no smoking, no open flames, etc.). Absorbent material will be made available in case of spills from these tanks to reduce fire risk (and environmental damage), as well as fire extinguishers in case the fuel is ignited.

5.3.1.1 Response Procedures

From the US Department of Transportation 1993 Emergency Response Guidebook, Guide 27.

- Isolate area, deny entry, keep unnecessary people away.
- Stay upwind, avoid low areas.
- Use positive pressure self-contained breathing apparatuses (SCBAs) and protective clothing when working to clean up or handle material.
- If there is a small fire, use dry chemical, CO₂, water spray or regular foam to extinguish. For large fires, use water spray, fog or regular foam to extinguish. Move container from fire area if it can be done without risk. Apply cooling water to sides of containers that are exposed to flames until well after the fire is out. Stay away from ends of tanks. For massive fires in cargo area, use unmanned hose holder or monitor nuzzles; if this is not possible, withdraw from area and let fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.
- For spills or leaks, shut off ignition sources; no flares, smoking or flames in the hazard area. Stop leak if it can be done without risk. Water spray may reduce vapor but may not prevent ignition in closed spaces. For small spills, take up with sand or other noncombustible absorbent material and place into container for disposal. For large spills, dike far ahead of liquid spill for later disposal.

First Aid

- Move victim to fresh air and call emergency medical care. If not breathing, give artificial respiration, or if breathing is difficult, give oxygen.
- In case of contact with material, immediately flush eyes with running water for at least 15 minutes. For skin contact, wash with soap and water.
- Remove and isolate contaminated clothing and shoes at the site.

5.3.1.2 Reporting Procedures

All spills will be reported to the ESHS Manager, the On-Site Manager, and the Safety Officer. In case of major spills, the ESHS Manager or the On-Site Manager will immediately report to the COO. A debriefing process will take place to determine the cause of the spill and how to prevent it. The recommendation will be included in an Incident Report that will be sent to the COO.

5.3.2 Batteries (all except those containing sodium) and Paints (corrosive liquid)

5.3.2.1 Response Procedures

From the US Department of Transportation 1993 Emergency Response Guidebook, Guide 60:

- Isolate area, deny entry, keep unnecessary people away.
- Stay upwind, avoid low areas.
- Use positive pressure SCBA and protective clothing when working to clean up or handle material.
- If there is a small fire, use dry chemical, CO₂, water spray or regular foam to extinguish. For large fires, use water spray, fog or regular foam to extinguish.
- For spills or leaks, do not walk through spilled material. Stop leak if it can be done without risk. For small spills, take up with sand or other noncombustible absorbent material and place into container for disposal. For large spills, dike far ahead of liquid spill for later disposal.

First Aid

- Move victim to fresh air and call emergency medical care.
- In case of contact with material, immediately flush eyes or skin with running water for at least 15 minutes.
- Remove and isolate contaminated clothing and shoes at the site.
- Keep victim quiet and maintain normal body temperature.

5.3.2.2 Reporting Procedures

All spills will be reported to the ESHS Manager, the On-Site Manager, and the Safety Officer. In case of major spills, the ESHS Manager or the On-Site Manager will immediately report to the COO. A debriefing process will take place to determine the cause of the spill and how to prevent it. The recommendation will be included in an Incident Report that will be sent to the COO.

5.3.3 Paint (Flammable Liquid)

5.3.3.1 Response Procedures

From the US Department of Transportation 1993 Emergency Response Guidebook, Guide 26:

- Isolate area, deny entry, keep unnecessary people away.
- Stay upwind, avoid low areas.
- Use positive pressure SCBA and protective clothing when working to clean up or handle material.
- If there is a small fire, use dry chemical, CO₂, water spray or alcohol resistant foam to extinguish. For large fires, use water spray, fog or alcohol resistant foam to extinguish. Apply cooling water to sides of containers that are exposed to flames until well after the fire is out. Stay away from ends of tanks. For massive fires in cargo area, use unmanned hose holder or monitor nuzzles; if this is not possible, withdraw from area and let fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.
- For spills or leaks, shut off ignition sources; no flares, smoking or flames in the hazard area. Stop leak if it can be done without risk. Water spray may reduce vapor but may not prevent ignition in closed spaces. For small spills, take up with sand or other noncombustible absorbent material and place into container for disposal. For large spills, dike far ahead of liquid spill for later disposal.

First Aid

- Move victim to fresh air and call emergency medical care. If not breathing, give artificial respiration, or if breathing is difficult, give oxygen.
- In case of contact with material, immediately flush eyes with running water for at least 15 minutes. For skin contact, wash with soap and water.
- Remove and isolate contaminated clothing and shoes at the site.

5.3.3.2 Reporting Procedures

All spills will be reported to the ESHS Manager, the On-Site Manager, and the Safety Officer. In case of major spills, the ESHS Manager or the On-Site Manager will immediately report to the COO. A debriefing process will take place to determine the cause of the spill and how to prevent it. The recommendation will be included in an Incident Report that will be sent to the COO.

5.4 Fire and Explosions

5.4.1 Preparedness

Article 89 of the Mongolian Law on Labor (MLL) requires that fire prevention measures be put in place, including installation of a fire alarm system, fire extinguishers and special equipment. In addition, employees shall be trained to use and maintain the equipment. Fire detection equipment will be installed at strategic locations and maintained on a regular basis.

WMMC is developing a coordinated system for fire, rescue, and emergency support. A fire department, an on-site medical care facility staffed by an EMT, and a security force station shall be established at the Mine Camp. Fire fighting and other specialized equipment needed for dealing with emergencies will be stored at the fire department. A medical clinic staffed with an EMT and experienced personnel will also be established. Emergency training will be provided to all employees and contractors. This training will include emergency identification, response, and notification. Identification training will include the recognition of potential problems (e.g., leaks, structural failure) and the designated chain of command to report such problems to the proper authorities. Response training will include identifying the location and proper use of all emergency equipment, the use of PPE, and procedures for raising the alarm and the notifying the emergency response team. This emergency medical service will be available to local inhabitants.

Following requirements in 30 CFR Section 36.31, a fire extinguisher will be carried in every mobile diesel-powered vehicle and mounted at a location easily accessible to the operator and protected from external damage.

5.4.2 Response Procedure

WMMC will establish an emergency response team to handle such incidents as fires and spills in the Project area. Team members will have special training to respond to various types of emergencies that may occur at the site. The team will be equipped with high-temperature protective suits, SCBAs, modern portable gas detection meters, and a variety of special gear for dealing with emergencies. There will be a central dispatcher who tracks and coordinates activities throughout the Project area.

5.5 Flooding

Flooding may occur during ice and snow melt in the spring. In addition, as the Tuul River is mostly recharged by precipitation, the water level is very unstable during summer and fall. When the water is slowly rising, employees are required to secure their workplace and leave for a safe area. Dredge operations will be shut down and the equipment secured to prevent them from being carried away by the floodwaters and possibly causing harm or environmental damage. Dredge Supervisors will be responsible for setting up a system to check that all employees have left and the dredges are secure. In case of flash flooding, all employees are to evacuate to higher ground immediately. A buddy system will be put in place to check if anyone is missing. Dredging operations, dredge ponds, pumping stations, and other facilities will be designed and located to minimize problems with water levels.

5.6 Medical Emergencies

5.6.1 Response Procedures

Emergency response to medical emergencies will be handled as follows:

- a) Everyone will be trained in first aid so that minor emergencies can be handled on the spot.
- b) For more serious emergencies, modern equipment will be provided locally for initial treatment of serious wounds, broken bones, hypothermia, etc. Personnel with serious injuries will be evacuated to an Ulaanbaatar hospital. A list of hospitals is provided in the **Appendix 1**.

- c) A local clinic for treatment of on-site injuries and conditions will be established for employees.
- d) Personnel with a serious medical injury or condition will be evacuated to a hospital in Beijing via helicopter. Arrangements with a hospital which has a helipad will be made ahead of time. A list of medical evacuation companies operating in Mongolia is listed in **Appendix 1**.

First aid and medical treatment for general injuries will be as follows (modified from the US Title 30 of the Code of Federal Regulations, Part 50.20-3).

1. Abrasion:

- (i) First aid treatment for this type of injury includes cleaning a wound, soaking, applying antiseptic and nonprescription medication and bandages. Follow-up treatment at the clinic may include observation, changing dressing and bandages, or additional cleaning and application of antiseptic if necessary.
- (ii) Medical treatment includes examination for removal of imbedded foreign material, soakings, whirlpool treatment, treatment of infection, or other professional treatments and any treatment involving more than a minor spot-type injury.

2. Bruises:

- (i) First aid treatment for this type of injury includes a soaking or application of cold compresses, and follow-up visits for observation.
- (ii) Medical treatment includes multiple soakings, draining of collected blood, or other treatment beyond observation.

3. Burns, Thermal and Chemical (resulting in destruction of tissue by direct contact):

- (i) First aid treatment for this type of injury includes cleaning or flushing the surface, soaking, applying cold compresses, antiseptics or nonprescription medications, and bandaging on the first visit, and follow-up visits restricted to observation, changing bandages, or additional cleaning. Most first-degree burns are amenable to first aid treatment.
- (ii) Medical treatment includes a series of treatments including soaks, whirlpool, skin grafts, and surgical debridement (cutting away dead skin). Most second- and third-degree burns require medical treatment.

4. Cuts and Lacerations:
 - (i) First aid treatment for this type of injury is the same as for abrasions.
 - (ii) Medical treatment includes the application of butterfly closures for non-cosmetic purposes, sutures (stitches), surgical debridement, treatment of infection, or other professional treatment.

5. Eye Injuries:
 - (i) First aid treatment for this type of injury includes irrigation, removal of foreign material not imbedded in eye, and application of nonprescription medications.
 - (ii) Medical treatment cases involve removal of imbedded foreign objects, use of prescription medications, or other professional treatment.

6. Inhalation of Toxic or Corrosive Gases:
 - (i) First aid treatment for this type of injury includes relocation of the person to fresh air or the one-time administration of oxygen for several minutes.
 - (ii) Medical treatment consists of any professional treatment beyond that mentioned under first aid.

7. Foreign Objects:
 - (i) First aid treatment for this type of injury includes cleaning the wound, removing any foreign object by tweezers or other simple techniques, application of antiseptics and nonprescription medications, and bandaging on the first visit.
 - (ii) Medical treatment consists of removal of any foreign object by physician depending on depth of embedment, size or shape of object, or location of wound. Other treatments may include treatment for infection, treatment of a reaction to tetanus booster, or other professional treatment.

8. Sprains and Strains:
 - (i) First aid treatment for this type of injury includes soaking, application of cold compresses, and use of elastic bandages.
 - (ii) Medical treatment includes a series of hot and cold soaks, use of whirlpools, diathermy treatment, or other professional treatment.

5.6.2 Notification and Reporting

All injuries should be reported to the Safety Officer or the ESHS Manager. The cause of the injury will be investigated and steps will be taken to prevent it from happening again.

5.7 Social Unrest

If the risk of social unrest in the general region increases, the following steps will be taken:

- Increase security patrol;
- Increase alert level during operations;
- Conduct evacuation briefing for employees;
- Prepare for evacuation, in case it becomes necessary;
- If deemed necessary, reduce mining operations and activity;
- Increase communications with local police and or government representatives; and
- Closely monitor the on-the-ground situation.

Should social unrest occur, employees will immediately be evacuated out of the area to Ulaanbaatar or another safe location.

6.0 Vehicles and Heavy Equipment

6.1 Vehicles

Vehicles and heavy equipment that will be used for Project activities will include trucks, a D6 or D7 bulldozer, a 20-ton excavator, two 20-ton tractors and trailers, and a backhoe. Vehicles will include sport-utility vehicles and shuttles to transport workers to and from the Mine Camp or within the Project area.

6.2 Transportation Accidents

Heavy equipment accidents will be reported to the On-Site Manager as soon as practical. The accident will be investigated and steps taken to prevent it from happening again. Inspection of the equipment will be made to determine if it is still safe to use after repairs. Small vehicle accidents will be reported to the On-Site Manager. Corrective measures will be taken to ensure that it does not happen again. These measures may include signage, driver's education, reflective liners on vehicles and clothing, improved lighting conditions, etc.

6.3 Transport of Hazardous Materials

Hazardous material transported to the site will be properly classed, described, packaged, marked, labeled, and in condition for shipment as required or authorized. Steps will be taken to ensure that safety and security is maintained during transportation. Employees will be trained to handle any spills and cleanup that may occur. Protective clothing and equipment will be included in the vehicles.

7.0 Additional Emergency Response Procedures

7.1 Hazard Recognition

WMMC will follow GIIPs and will require each employee to be instructed about the physical and health hazards of chemicals in work areas, the protective measures against these hazards, and the contents of the mine's Hazard Communication (HazCom) program. Hazard identification information can be found in the MSDS. All chemicals will have warning labels on the container and an inventory of all chemicals used at a location will be made available for employees. The MSDS will have information on the safe use of the chemical, including procedural information for cleaning up spills and leaks. Health hazard information is also included, both for short-term exposure as well as long-term (e.g., carcinogenic) effects. Chemical control measures (engineering controls, work practices, and PPE) will also be provided so that employees will have the knowledge to protect themselves.

7.2 Emergency Response Training

Emergency training will be provided to all employees and contractors. This training would include emergency identification, response, and notification. Identification training will include the recognition of potential problems (e.g., leaks, structural failure) and the designated chain of command to report such problems to the proper authorities. Response training will include identifying the location and proper use of all emergency equipment, the use of PPE, and procedures for raising the alarm and notifying the emergency response team. Emergency training for all employees and contractors will be conducted once a month during active dredge and floating process plant operations.

7.3 Employee and Contractor Training

Prior to Project operations, safety training will be conducted and record keeping will be maintained. The Company will conduct a training program for all new employees hired for the Project. Only after the training course has been completed will the employees be given their work duties. Some topics will include:

- (1) Instruction on the statutory rights of employees under Mongolian law; authority and responsibility of supervisors. The course will include instruction on the statutory rights of employees, an introduction to the Company's rules and the procedures for reporting hazards.
- (2) Self-rescue and respiratory devices. The course will include instruction and demonstration in the use, care, and maintenance of self-rescue and respiratory devices, where applicable.
- (3) Transportation controls and communication systems. The course will include instruction on the procedures in effect for riding on and in mine conveyances where applicable; the controls for the transportation of employees and materials; and the use of communication systems, warning signals, and directional signs.
- (4) Introduction to work environment. The course will include a visit and tour of the mine, or portions of the mine that are representative of the entire mine. The method of mining or operation utilized will be observed and explained.
- (5) Escape and emergency evacuation plans; fire warning and firefighting. The course will include a review of the dredge and floating process plant escape system, and escape and emergency evacuation plans in effect at the mine site; and instruction in the fire warning signals and firefighting procedures.
- (6) Ground control; working in areas of highwalls, water hazards, pits and spoil banks; illumination and night work. The course will include an introduction to and instruction on the highwall and ground control plans in effect at the mine; procedures for working safely in areas of highwalls, water hazards, pits and spoil banks; the illumination of work areas; and safe work procedures during the hours of darkness.
- (7) Health. The course will include instruction on the purpose of taking dust, noise and other health measurements, and any health control plan in effect at the mine will be explained. Health provisions and warning labels will also be explained.

- (8) Hazard recognition. The course will include the recognition and avoidance of hazards present at the mine.
- (9) Electrical hazards. The course will include recognition and avoidance of electrical hazards.
- (10) First aid. The course will include instruction in first aid methods.
- (11) Health and safety aspects of the tasks to which the new employee will be assigned. The course will include instructions in the health and safety aspects of the tasks to be assigned, including the safe work procedures of such tasks, the mandatory health and safety standards pertinent to such tasks, information about the physical and health hazards of chemicals in work areas, the protective measures against these hazards, and the contents of the mine's HazCom program.

Afterwards, an annual refresher course program will be conducted at the beginning of each mining season.

In addition, employees will receive periodic hazard training on a monthly basis, to include the following topics.

1. Hazard recognition and avoidance;
2. Emergency and evacuation procedures;
3. Health and safety standards, safety rules and safe working procedures;
and
4. Self-rescue and respiratory devices.

APPENDIX 1 Medical Emergency Information

List of Hospitals

SOS Medical Clinic in Ulaanbaatar (SOS Medica Mongolia): This is the most modern medical facility in Mongolia with all English-speaking staff. This clinic serves as a primary care and emergency stabilization facility for clinic members who are visiting or living in Mongolia. This is a membership-based facility with available corporate memberships of all sizes; non-members will be treated, but must pay 90 USD to local doctors and 180 USD to international doctors for basic examinations and additional fees for medicine and other treatment. This clinic can offer referrals to specialists and other facilities as necessary. Cash and some credit cards are accepted.

The SOS Medical Clinic has x-ray and general lab facilities onsite. They provide the following services:

- general practice consultation/family medicine;
- emergency medicine;
- x-ray;
- laboratory;
- pharmacy stocked with medications imported from the West;
- ante-natal care;
- travel medicine;
- health examinations;
- vaccination advice; and
- wellness programs.

The clinic is open from 9:00 to 18:00 Monday to Friday with medical staff on call 24/7 to deal with emergencies. They can also quickly arrange emergency evacuations through their alarm center in Beijing. The clinic's address and contact information are as follows:

4a Building, Big Ring Road,
15th Micro District 7th Khoroo, Bayanzurkh District,
Ulaanbaatar, Mongolia
Telephone: +976-11-464-175/76/77
Fax: +976-11-454537
contactus@sosmedica.mn

Hospital Number 2: This hospital is Mongolian-run and it is the designated hospital for foreigners in Mongolia and is the hospital for high-ranking officials of the Mongolia government. It is generally considered to have the best care available in a Mongolian facility, but due to supply shortages it may not be able to perform all procedures.

The hospital is staffed with ten doctors who speak English; some of the doctors have been trained in Japan, Germany, and the UK. The Medical Director, Dr. Bayasgalsn, speaks fluent English. Translation services are provided if an English-speaking doctor is not available. The hospital has just over 240 beds with a six bed Intensive Care Unit. Its diagnostic capabilities include an x-ray machine, ultrasound, endoscopy, EKG, EEG, a bacteriological, clinical and biochemical laboratory.

Private, modern rooms with fridge and TV can be set up for foreigners. Interpreter services are provided if an English speaking doctor is not available. It is best to bring interpreter and someone to accompany you to supervise your diagnosis and treatment. The hospital staffs a 24-hour Emergency Room and 24-hour ambulance service is available. The hospital is located on Peace Avenue, at the west side of the British Embassy or opposite the Naran Shop in the 13th micro-district. If possible, call for an appointment beforehand:

- Dr. Bayasgalan, General Director
 - Telephone: +976-11- 458-191
 - Cell Phone:+ 976-9911-0437
 - Fax: +976-11- 458-191
- Dr. Ukhnaa, Vice Director
 - Telephone: +976-11-450-490
 - Cell Phone: +976-9923-4474
 - Emergency Telephone: +976-11-450-129

Yonsei Friendship Hospital: This facility is a Korean-Mongolian outpatient clinic and has dentistry services as well. Yonsei University is one of the three largest universities in Korea and the only one involved in a medical exchange program with Mongolia. Christian missionaries founded Yonsei University one hundred years ago. Over the years, they have established “Friendship Hospitals” in Africa, South America, and Asia.

These facilities are designed to provide quality medical care at affordable prices to the local population as well as foreigners who wish to use their services. The clinic occupies an entire two-story building with 15 rooms on each floor. Surgical care is available for routine and simple procedures. Routine visits and lab tests cost 1.00 to 2.00 USD. They are equipped for x-ray and lab work onsite.

There are a couple of English speaking doctors (therapist, dentist, and pediatrician). The clinic has some ambulances standing by. Work hours are Monday

through Friday: 9:00 to 16:30. The hospital location and general phone and fax numbers are:

Peace Avenue -13
Ulaanbaatar, Mongolia
Telephone: + 976-11-310-945, 976-11-313321
Fax: +976-11-329-589

Contact information for individual doctors and directors area as follows:

- Dr. Pak Dun Sun, the Director (speaks English).
 - Telephone: +976-11-313-321
- Altantuya, Vice Director (speaks English)
 - Telephone: +976-11-323-055.
- Dr. Ho Sui Ko, Dentist
 - Telephone: +976-91-91-7005, 976-11-313-178

Emergency Evacuation Service

SOS Medica Mongolia: This facility provides emergency medical evacuation service both within and out of Mongolia. Evacuation cost to Beijing is approximately 30,000 USD, however since the evacuation insurance company of the evacuee covers the cost, the insurance company will decide which airline will do the evacuation.

Phone: 976-99-11-03-35, 976-11-345-526 (Ariunaa, receptionist)

Also contact Manager Jane Youngs.

Contact information for the regional office for evacuation operations:

Building C, BITIC Leasing Center, No. 1 North Road,
Xing Fu San Cun, Chaoyang District,
Beijing, China, 100027

Marketing: 86-10-6462-0555.

Fax: 86-10-6462-9188

E-mail: China.Marketing@internationalsos.com

Clinic: 86-10-6462-9112

Alarm Center: 86-10-6462-9100

Global Rescue: This emergency services company provides best-in-class medical, aeromedical evacuation, search and rescue, and security services to company's emergency response teams. Global rescue are comprised of paramedics, physicians, and security personnel, many of whom are veterans of elite rescue units of the U.S. Air Force. Global Rescue utilizes over 180 medically equipped aircraft in 30 countries and will fly members to the U.S. hospital of their choice in the event of an illness or injury requiring hospitalization. For more information, visit <http://www.globalrescue.com/>.

There contact information is as follows:

Telephone: +617-459-4200 or +800-381-9754

Fax: +617-507-1050

Email: help@globalrescue.com

115 Broad Street, Suite 350

Boston, MA 02110 USA

WMMC will provide support for medical personnel, supplies, and equipment at the Mine Camp in cooperation with the Zaamar and Buregkhangai Community Health Facilities.

APPENDIX 2 IFC Environment, Health and Safety Guidelines

Health and Safety requirements of the IFC General EHS Guidelines and the EHS Guidelines for Mining are summarized below.

IFC General EHS Guidelines

The IFC General EHS Guidelines, dated April 2007, contain the performance levels and measures that IFC has determined are generally considered to be achievable at reasonable costs by existing technology. The application of these guidelines should be tailored to the hazards and risks established for each project on the basis of the results of the environmental assessment, in which site-specific variables, such as the host country context, assimilative capacity of the environment, and other project-specific factors, are taken into account. For example, the environmental assessment process may provide justification for alternative project-specific standards or requirements, such as project location, processes, or mitigation measures.

These General EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). These general guidelines are designed to be utilized in conjunction with relevant industry-sector EHS guidelines. The General EHS Guidelines are organized as follows:

- Environmental
 - Air Emissions and Ambient Air Quality
 - Energy Conservation
 - Wastewater and Ambient Water Quality
 - Water Conservation
 - Hazardous Materials Management
 - Waste Management
 - Noise
 - Contaminated Land
- Occupational Health and Safety
 - General Facility Design and Operation
 - Communication and Training
 - Physical Hazards
 - Chemical Hazards
 - Biological Hazards
 - Radiological Hazards
 - Personal Protective Equipment
 - Special Hazard Environments
 - Monitoring
- Community Health and Safety
 - Water Quality and Availability
 - Structural Safety and Project Infrastructure

- Life and Fire Safety
- Traffic Safety
- Transport of Hazardous Materials
- Disease Prevention
- Emergency Preparedness and Response
- Construction and Decommissioning
 - Environment
 - Occupational Health and Safety
 - Community Health and Safety

Effective management incorporates EHS issues into corporate- and facility-level business processes in an organized, hierarchal approach. This involves:

- identifying EHS project hazards and associated risks as early as possible in the facility development or project cycle;
- utilizing EHS professionals with the experience, competence, and training necessary to assess and manage EHS impacts and risks, and carry out specialized environmental management functions; and
- understanding the likelihood and magnitude of EHS risks based on:
 - the nature of the project activities,
 - the potential consequences to workers, communities, or the environment if hazards are not adequately managed;
 - prioritizing risk management strategies with the objective of achieving an overall reduction of risk to human health and the environment;
 - favoring strategies that eliminate the cause of the hazard at its source;
 - incorporating engineering and management controls to reduce or minimize the possibility and magnitude of undesired consequences when impact avoidance is not feasible;
 - preparing workers and nearby communities to respond to accidents, including providing technical and financial resources to effectively and safely control such events, and restoring workplace and community environments to a safe and healthy condition; and
 - improving EHS performance through a combination of ongoing monitoring of facility performance and effective accountability.

The specific EHS Guidelines for Mining, to be utilized in conjunction with the General EHS Guidelines, are described in the following section.

IFC EHS Guidelines for Mining

The IFC EHS Guidelines for Mining, dated December 2007, provide for inclusion of results from the SEIA process. Although some specific performance standards are provided, these levels and measures can be adjusted and customized for each particular project.

The EHS Guidelines for Mining include the following topics:

- Industry-Specific Impacts
 - Environmental
 - Water use and quality
 - Wastes
 - Hazardous materials
 - Land use and biodiversity
 - Air quality
 - Noise and vibrations
 - Energy use
 - Visual impacts
 - Occupational Health and Safety
 - General workplace health and safety
 - Hazardous substances
 - Use of explosives
 - Electrical safety and isolation
 - Physical hazards
 - Ionizing radiation
 - Fitness for work
 - Travel and remote site health
 - Thermal stress
 - Noise and vibration
 - Specific hazards in underground mining
 - Community Health and Safety
 - Tailings dam safety
 - Water storage dams
 - Land subsidence
 - Emergency preparedness and response
 - Communicable diseases
 - Specific vector control and prevention strategies
 - Mine Closure and Post-Closure
 - Financial feasibility
 - Chemical integrity
 - Ecological habitat integrity
- Performance Indicators and Monitoring
 - Environment
 - Emissions and effluent guidelines

- Environmental monitoring
- Occupational Health and Safety Performance
 - Occupational health and safety guidelines
 - Accident and fatality rates
 - Occupational health and safety monitoring

Certain aspects of the IFC EHS Mining Guidelines are described in further detail below.

General Workplace Health and Safety

Recommended strategies to manage general workplace safety hazards include the following:

- Mining exploration and development activities should manage occupational health and safety hazards as part of a comprehensive health and safety management plan incorporating the following aspects:
 - Preparation of emergency response plans specifically applicable to exploration and production activities (considering the often geographically isolated nature of mining sites) and including the provision and maintenance of necessary emergency response and rescue equipment;
 - Sufficient number of first aid trained employees to respond to emergencies;
 - Implementation of specific personnel training on worksite health and safety management including a communication program with a clear message about corporate management's commitment to health and safety. The communication program should also include regular meetings such as daily talks prior to initiation of work shifts;
 - Integration of behavioral considerations into health and safety management, including on- the-job behavioral observation processes;
 - Training of employees on the recognition and prevention of occupational hazards specifically applicable to work in remote areas such as safety with respect to wildlife; protection against the elements; thermal stress; acclimatization; disease exposure; and navigational aids to avoid becoming lost;
- Illumination systems should be adequate and safe for the planned working conditions in travel paths, mine working areas, and within and around surface facilities and dumpsites of mines. Additional illumination guidance includes adherence to local standard requirements for illumination for mobile equipment operating above ground and on public roads;
- Signage in hazardous and risky areas, installations, materials, safety measures, emergency exits, and other such areas should be in accordance with international standards (including standards of cleanliness, visibility and reflectance in areas of potentially poor illumination or sources of dust

- and pollution), be known and easily understood by workers, visitors, and as appropriate the general public;
- To the extent that alternative technologies, work plans or procedures cannot eliminate or sufficiently reduce a hazard or exposure, the mine operators should provide workers and visitors with the necessary PPE, and provide instruction and monitoring in their appropriate maintenance and use. Applicable PPE include, at a minimum, safety helmets and footwear, in addition to ear, eye, and hand protection devices.
 - Occupational health assessments should be conducted for employees on a regular basis, based on exposure to risk. Medical records should be retained for at least 20 years.

Performance Indicators and Monitoring

The following discusses certain performance indicators and monitoring noted in the IFC General EHS Guidelines and the IFC EHS Guidelines for Mining. Monitoring of direct and indirect indicators of emissions, effluents and resource use is project-specific. Monitoring should be conducted by trained individuals implementing appropriate monitoring procedures, utilizing properly calibrated and maintained equipment. The monitoring records should be frequently reviewed, updated and maintained; and should be compared with the applicable standards to ensure adequate measures are promptly performed when necessary to minimize adverse impacts to the environment and humans. These guidelines act as a powerful tool to avoid mistakes, reduce development cost and improve project sustainability.

These guidelines are intended to provide a standard against which the Project's performance is monitored. Compliance with the guidelines is the expected standard, in addition to compliance with applicable local, national and international laws.

Air Quality

Air emissions should not exceed the relevant ambient air quality guidelines and standards by applying national legislated standards or the current World Health Organization (WHO) Air Quality Guidelines (2006a). Ambient air quality is to be monitored at the Project boundary and/or off-site, depending on the results of scientific methods and modeling. The current WHO Air Quality Guidelines are provided in **Table 1-1**.

Table 1-1 WHO Ambient Air Quality Guidelines

Parameter	Averaging Period	Guideline Value (µg/m ³)
Particulate Matter (PM) _{2.5}	annual mean	10
	24-hour mean	25
PM ₁₀	annual mean	20
	24-hour mean	50
Ozone (O ₃)	8-hour mean	100
Nitrogen dioxide (NO ₂)	annual mean	40
	1-hour mean	200
Sulfur dioxide (SO ₂)	24-hour mean	20
	10-minute mean	500

The air quality of the workplace should follow the time-weighted average threshold limit values (e.g., eight hours per day, 40 hours per week) of the American Conference of Governmental Industrial Hygienists (ACGIH).

Water Use and Quality

Water used for drinking must meet the local and national standards or, in their absence, WHO Guidelines for Drinking Water Quality (2006b). WHO provides microbial and chemical water quality targets to protect the health of humans. **Table 1-2** lists and describes these waterborne pathogens (WHO, 2006b). However, only a portion of the waterborne pathogens listed may be present at the Project area. Per WHO Guidelines for Drinking Water Quality, all water directly intended for drinking must not have E. coli or thermotolerant coliform bacteria detected in any 100-milliliter sample (2006b).

Table 1-2 WHO-Waterborne Pathogens and their Significance in Water Supplies

Pathogen	Health Significance	Persistence in Water Supplies	Resistance to Chlorine	Relative Infectivity	Important Animal Source
BACTERIA					
<i>Burkholderia pseudomallei</i>	Low	May multiply	Low	Low	No
<i>Campylobacter jejuni, C. coli</i>	High	Moderate	Low	Moderate	Yes
<i>Escherichia coli</i> – Pathogenic	High	Moderate	Low	Low	Yes
<i>E. coli</i> – Enterohaemorrhagic	High	Moderate	Low	High	Yes
<i>Legionella spp.</i>	High	Multiply	Low	Moderate	No
Non-tuberculous mycobacteria	Low	Multiply	High	Low	No
<i>Pseudomonas aeruginosa</i>	Moderate	May multiply	Moderate	Low	No
<i>Salmonella typhi</i>	High	Moderate	Low	Low	No
Other salmonellae	High	May multiply	Low	Low	Yes
<i>Shigella spp.</i>	High	Short	Low	Moderate	No
<i>Vibrio cholerae</i>	High	Short	Low	Low	No
<i>Yersinia enterocolitica</i>	High	Long	Low	Low	Yes
VIRUSES					
Adenoviruses	High	Long	Moderate	High	No
Enteroviruses	High	Long	Moderate	High	No
Hepatitis A virus	High	Long	Moderate	High	No
Hepatitis E virus	High	Long	Moderate	High	Potentially
Noroviruses and sapoviruses	High	Long	Moderate	High	Potentially
Rotaviruses	High	Long	Moderate	High	No
PROTOZOA					
<i>Acanthamoeba spp.</i>	High	Long	High	High	No
<i>Cryptosporidium parvum</i>	High	Long	High	High	Yes
<i>Cyclospora cayetanensis</i>	High	Long	High	High	No
<i>Entamoeba histolytica</i>	High	Moderate	High	High	No
<i>Giardia intestinalis</i>	High	Moderate	High	High	Yes
<i>Naegleria fowleri</i>	High	May multiply	High	High	No
<i>Toxoplasma gondii</i>	High	Long	High	High	Yes
HELMINTHS					
<i>Dracunculus medinensis</i>	High	Moderate	Moderate	High	No
<i>Schistosoma spp.</i>	High	Short	Moderate	High	Yes

The Chemical Abstracts Service has more than 36 million registered chemicals (Chemical Abstracts Service, 2007). As such, parameters or chemicals specific to the Project operations as well as the Project environment were selected for monitoring. WHO utilizes six categories to identify the sources of chemical constituents (2006b):

- Naturally occurring;
- Industrial sources and human dwellings;
- Agricultural activities;
- Water treatment or materials in contact with drinking water;
- Pesticides used in water for public health; and
- Cyanobacteria.

Drinking-water guidelines are provided in **Table 1-3** and **Table 1-4** from the WHO Guidelines for Drinking Water Quality (2006b).

Table 1-3 WHO Drinking Water Guideline Values Significant to Health

Chemical	Guideline Value
NATURALLY OCCURRING	
Arsenic	0.01 milligrams per liter (mg/L)
Barium	0.7 mg/L
Boron	0.5 mg/L
Chromium (total)	0.05 mg/L
Fluoride	1.5 mg/L
Manganese	0.4 mg/L
Molybdenum	0.07 mg/L
Selenium	0.01 mg/L
Uranium	0.015 mg/L
INDUSTRIAL SOURCES AND HUMAN DWELLINGS	
Benzene	10 micrograms per liter (µg/L)
Cadmium	0.003 mg/L
Carbon tetrachloride	4 µg/L
Cyanide	0.07 mg/L
Di(2-ethylhexyl)phthalate	8 µg/L
Dichlorobenzene, 1,2-	1,000 µg/L
Dichlorobenzene, 1,4-	300 µg/L
Dichloroethane, 1,2-	30 µg/L
Dichloroethene, 1,2-	50 µg/L
Dichloromethane	20 µg/L
Dioxane, 1,4-	50 µg/L
Edetic acid (EDTA)	600 µg/L
Ethylbenzene	300 µg/L
Hexachlorobutadiene	0.6 µg/L

Chemical	Guideline Value
Mercury (inorganic)	0.006 mg/L
Nitritotriacetic acid (NTA)	200 µg/L
Pentachlorophenol	9 µg/L
Styrene	20 µg/L
Tetrachloroethene	40 µg/L
Toluene	700 µg/L
Trichloroethene	20 µg/L
Xylenes	500 µg/L
AGRICULTURAL ACTIVITIES	
Nitrate	50 mg/L (short-term exposure)
Nitrite	3 mg/L (short-term exposure)
	0.2 mg/L (long-term exposure)
Alachlor	20 µg/L
Aldicarb	10 µg/L
Aldrin and dieldrin	0.03 µg/L
Atrazine	2 µg/L
Carbofuran	7 µg/L
Chlordane	0.2 µg/L
Chlorotoluron	30 µg/L
Cyanazine	0.6 µg/L
2,4-dichlorophenoxyacetic acid (2-4-D)	30 µg/L
2,4-DB	90 µg/L
1,2-Dibromo-3-chloropropane	1 µg/L
1,2-Dibromoethane	0.4 µg/L
1,2-Dichloropropane (1,2-DCP)	40 µg/L
1,3-Dichloropropene	20 µg/L
Dichlorprop	100 µg/L
Dimethoate	6 µg/L
Endrin	0.6 µg/L
Fenoprop	9 µg/L
Isoproturon	9 µg/L
Lindane	2 µg/L
MCPA	2 µg/L
Mecoprop	10 µg/L
Methoxychlor	20 µg/L
Metolachlor	10 µg/L
Molinate	6 µg/L
Pendimethalin	20 µg/L
Simazine	2 µg/L
2,4,5-T	9 µg/L

Chemical	Guideline Value
Terbutylazine	7 µg/L
Trifluralin	20 µg/L
WATER TREATMENT	
Acrylamide	0.5 µg/L
Antimony	20 µg/L
Benzo[a]pyrene	0.7 µg/L
Bromate	10 µg/L
Bromodichloromethane	60 µg/L
Bromoform	100 µg/L
Chlorate	700 µg/L
Chlorine ¹	5 mg/L
Chlorite	700 µg/L
Chloroform	300 µg/L
Copper	2,000 µg/L
Cyanogen chloride	70 µg/L
Dibromoacetonitrile	70 µg/L
Dibromochloromethane	100 µg/L
Dichloroacetate	50 µg/L
Dichloroacetonitrile	20 µg/L
Epichlorohydrin	0.4 µg/L
Lead	10 µg/L
Monochloramine	3 mg/L
Monochloroacetate	20 µg/L
Nickel	70 µg/L
Trichloroacetate	200 µg/L
Trichlorophenol, 2,4,6-	200 µg/L
Trihalomethanes	See note below. ²
Vinyl chloride	0.3 µg/L
PESTICIDES USED IN WATER FOR PUBLIC HEALTH	
Chlorpyrifos	30 µg/L
DDT and metabolites	1 µg/L
Permethrin	300 µg/L
Pyriproxyfen	300 µg/L
CYANOTOXIN	
Microcystin-LR	1 µg/L

¹ For effective disinfection, a concentration of free chlorine of ≥ 0.5 mg/L after at least 30 minutes at pH < 8. standard units should be residual.

² The sum of the ratio of the concentration of each to its respective guideline value should not exceed 1.

Table 1-4 WHO Acceptable Consumer Drinking Water Guideline Values (Not Significant to Health)

Chemical	Guideline Value
Aluminum	0.2 mg/L
Ammonia	35 mg/L (taste)
	1.5 mg/L (odor)
Chloride	250 mg/L
Color	15 true color units (TCUs)
Hydrogen sulfide	0.05 to 0.1 mg/L
Iron	0.3 mg/L
pH	6.5 to 9.5 standard units
Silver	0.1 mg/L
Sodium	200 mg/L
Sulfate	250 mg/L
Taste and odor	Not observable
Temperature	Cooler
Total hardness	100 to 300 mg/L
Total dissolved solids	1,200 mg/L
Turbidity	5 nephelometric turbidity units (NTUs) (appearance)
	0.1 NTU (effective disinfection)
Zinc	3 mg/L

Wastewater quality is managed by treating and managing liquid effluent. Liquid effluent includes storm water, process effluents, drainage (from active or closed mines, disposal sites for overburden, waste rock, etc.), surface runoff from paved or unpaved areas, and sanitary wastewater (except if passing to a sewage treatment system). In addition to the mining effluent guidelines, guidelines exist for accidental discharge and prevention of groundwater pollution.

The IFC EHS Guidelines for Mining contain limitations for such parameters as pH, five-day BOD, oil and grease, TSS, and temperature. **Table 1-5** displays the IFC Liquid Effluent Guidelines, which summarize the maximum contaminant concentrations in liquid effluent under normal operating conditions.

Table 1-5 IFC EHS Mining Effluent Guidelines

Parameter ¹	Guideline Value
TSS	50 mg//L
pH	6 to 9 standard units
Chemical oxygen demand	150 mg/L
Five-day BOD	50 mg/L
Oil and grease	10 mg/L
Arsenic	0.1 mg/L
Cadmium	0.05 mg/L
Chromium, hexavalent	0.1 mg/L
Copper	0.3 mg/L
Cyanide	1 mg/L
Cyanide free	0.1 mg/L
Cyanide WAD	0.5 mg/L
Iron	2.0 mg/L
Lead	0.2 mg/L
Mercury	0.002 mg/L
Nickel	0.5 mg/L
Phenols	0.5 mg/L
Zinc	0.5 mg/L
Temperature ²	< 3 degrees Celsius (°C) differential

¹ Metal concentrations represent total metals.

² Effluent temperature should not result in an increase of more than 3 °C of the ambient temperature at the edge of the scientifically established mixing zone which accounts for ambient water quality, receiving water use, and assimilative capacity among other considerations.

Waste

Waste management should be planned, designed and implemented such that geotechnical risks and environmental impacts are addressed throughout the life of the mine. Wastes may include, but are not limited to, waste rock, tailings, workshop scrap, household waste, non-process related industrial waste, and waste oils and chemicals.

Solid waste disposal must be performed in an environmentally secure manner. Recycling or reclaiming material is encouraged, and, if not practical, the waste must be disposed in an environmentally acceptable manner that complies with local laws and regulations. Waste rock deposition areas should be engineered to isolate materials with high potential for generating acid leachate from oxidation or percolating water.

Solvents and other hazardous materials must not be disposed of in a manner likely to result in soil, surface water, or groundwater contamination.

Illumination

Table 1-6 shows the minimum average illumination limits for travel paths and work areas of the Project area.

Table 1-6 IFC Mining EHS Standards for Minimum Average Illumination for Designated Mine Locations and Activities

Location/Activity	Minimum Average Illumination (Lux)
Emergency lighting	5
Walkways and passages	5 - 10
Dynamic locations (production and development areas)	5 - 50
Areas with occasional and simple manual tasks	50 - 100
Workstations and areas with medium to high precision manual tasks	150 - 400

Noise

Noise prevention and control measures will be implemented when Project noise levels exceed the noise level guidelines (**Table 1-7**, **Table 1-8**, and **Table 1-9**) at the most sensitive point of reception. Project noise should not result in a maximum increase of three decibels (dBs) at the nearest receptor off-site. Sound level meters (Type 1 or 2) should log data at least hourly for as much as 48 hours, and be located about 1.5 meters above the ground surface and three meters from any reflecting surface.

Table 1-7 IFC General EHS Noise Guidelines

Receptor	One-Hour LAeq (dBA)	
	Day (07:00 to 22:00)	Night (22:00 to 07:00)
Residential, institutional, educational	55	45
Industrial, commercial	70	70

Table 1-8 WHO Noise Level Guidelines

Specific Environment	LAeq (dBA) ^a	Time Base (hours)	LAmx fast (dBA) ^b
Indoor dwelling and school class room	30 to 35	variable	variable
Outdoor living area	50 to 55	16	--
Industrial, commercial shopping and traffic areas, indoors and outdoors	70	24	110

Source: WHO, 1999

^a LAeq (dBA) = long-term A-weighted sound pressure level equivalent

^b LAmx fast (dBA) = maximum A-weighted sound pressure level at the “fast” meter setting

Table 1-9 IFC General EHS Noise Limits for Various Working Environments

Location/Activity	Eight-Hour LAeq (dBA)	LAmx fast (dBA)
Heavy industry (no need for oral communication)	85	110
Light industry (decreasing need for oral communication)	50 to 65	110
Open offices, control rooms, service counters, or similar	45 to 50	--
Individual offices (no noise disturbance)	40 to 45	--
Classrooms, lecture halls	35 to 40	--
Hospitals	30 to 35	40

Workers should utilize hearing protection capable of reducing sound levels at the ear to at least 85 dBA when:

- exposed to a sound pressure level above 85 dBA more than eight hours per day;
- exposed to an instantaneous peak sound pressure level of more than 140 C-weighted sound pressure level (dBC); and
- the average maximum sound pressure level is equal to or more than 110 dBA.

Large equipment should be equipped with a soundproof cab. Workers exposed to high noise levels should have periodic hearing assessments.

Vibration

Typically, blasting activities produce the most significant vibrations at a mine. Vibrations may be minimized by: utilizing mechanical ripping instead of explosives; developing a blast design based on the results from a blasting-surfaces survey and a drill-hole survey; utilizing specific blasting pans, correct charging procedures and blast ratios; utilizing delayed/micro-delayed or electronic detonators, and specific in-situ blasting tests; implementing good vibration and overpressure control; and, adequately designing the foundations of vibrating equipment. Vibration threshold limit values are provided by the ACGIH. Exposure levels should be monitored and recorded on a daily basis.

Occupational Health and Safety Monitoring

As part of an established occupational health and safety program, monitoring should be performed by accredited professionals (e.g., certified industrial hygienists, registered occupational hygienists, certified safety professionals). These accredited professionals design, implement, monitor, and audit health and safety throughout the workplace. Proper occupational health and safety records will be maintained throughout the life of the Project.

Emergency Preparedness and Response

An Emergency Response Plan should be established in accordance with the United Nations Environment Programme Awareness and Preparedness for Emergencies at the Local Level (APPEL) for Mining (2001). Workers as well as community emergency response personnel should be trained to apply the Emergency Response Plan.

APPENDIX 3 MSHA Guidelines

MSHA tips and safety ideas applicable to surface metal mining

From: http://www.msha.gov/Accident_Prevention/appcategories.htm

- MSHA's Accident Prevention Program: Safety Ideas and Tips by Mine Type
- MSHA's Guide to Equipment Guarding
- Tips for Dusty Jobs

MSHA's Occupational Illness and Injury Prevention Program: Health Ideas and Tips by Mine Type

Waste Management Plan

Social and Environmental Management and Monitoring Program

Big Bend Placer Gold Mining Project



Prepared for



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List of Abbreviations and Acronyms

cm	centimeters
IFC	International Finance Corporation
mg	milligrams
ng	nanograms
NO ₂	nitrite
Nm ³	Newtons times cubic meter
OPIC	Overseas Private Investment Corporation
Project	Big Bend Gold Mining Project
RRA	recycling and reuse area
SEIA	Social and Environmental Impact Assessment
WMMC	WM Mining Company, LLC
WMP	Waste Management Plan

1.0 Introduction

1.1 Background

This document provides the Waste Management Plan (WMP) for the Big Bend Placer Gold Mining Project (Project), located in Mongolia, proposed for development by WM Mining Company, LLC (WMMC). The Project is to be carried out in an environmentally responsible manner with inclusion of environmental mitigation and waste management programs that comply with local regulations, as well as, international standards for mining projects.

1.2 Waste Management Plan

This WMP outlines the Project commitment to taking all necessary steps to ensure that the collection, storage, transportation and disposal of all wastes generated during project operations will be conducted in a safe, efficient and environmentally responsible manner.

The WMP detailed in this document has been prepared in consideration of all proposed mining facilities, equipment and staff, local meteorological characteristics, proximity to major population centers, subsurface conditions, mineral resources, as well as surface water and groundwater conditions.

1.3 Scope

The WMP identifies anticipated wastes and estimates the quantities to be generated throughout the life of the project. It establishes roles and responsibilities to be undertaken by site management and staff, contractors and vendors and other project participants and sets guidelines for the handling of waste.

The objective of the plan is to create a framework for handling and disposal of wastes that is safe and environmentally responsible.

1.4 Objectives

The objectives of the WMP are to:

- minimize waste through reduction, reuse and recycling practices to the extent possible; and review/approve all orders for materials, chemicals, and supplies to limit environmental impact;
- protect the health and safety of people;
- prevent adverse impacts on the environment including people, flora, fauna, surface water and groundwater resources and air;

- stabilize waste through treatment and disposal;
- ensure due diligence is followed by all project personnel;
- track waste generation, handling and disposal to assess whether or not waste management is being carried out in a responsible manner;
- avoid costly clean-up; and
- ensure a logical and efficient plan for waste collection and disposal which minimizes double-handling of materials and is cost-effective.

1.5 General Strategies

General strategies that will be adopted to achieve the objectives are:

- Proactive procurement policy: Tender / Bid documents will notify prospective bidders of the environmental sensitivity of the site and solicit the use of environmentally suitable materials, equipment and products. The proactive procurement policy will read as follows:

“Vendors are advised of the environmental sensitivity of the Place of the Work and the need to use and provide environmentally suitable materials and products. At the purchasing stage, the possibility of material substitution with more environmentally friendly alternatives will be examined for all materials that are hazardous to handle, generate hazardous wastes or otherwise have the potential to create environmental problems.”

- Strategic material and chemical substitution: At the purchasing stage, the possibility of material substitution with material of lesser environmental concerns will be examined.
- Waste segregation: All contractors and site personnel will be required to implement category-wise segregation of waste in keeping with this WMP.
- Reduction initiatives: Processes and materials used will be evaluated on the basis of possible reduction in raw material usage.
- Recovery/reuse initiatives: Recovery of usable material or energy as a by-product and opportunities for on-site reuse of waste materials will be highly encouraged.
- Recycling initiatives: Waste segregation will be facilitated as local recyclable material markets are established.
- Appropriate treatment and disposal is the final option for waste management.
- Conduct a waste audit on an annual basis to confirm the total quantities of hazardous and non-hazardous waste generation, quantities and success of waste diversion programs and waste quantities landfilled on-site. WMMC will keep detailed records of all waste shipments on and off-site as well as estimate the annual volumetric change in the waste disposal site which will be reported in the waste audit.

2.0 Regulatory Requirements and Guidelines

The WMP is designed to ensure compliance with all relevant environmental regulations and the WMMC's environmental standards. These include maintaining consistency with the policies of the Overseas Private Investment Corporation (OPIC), World Bank/International Finance Corporation (IFC) environmental standards, the "Equator Principles", as well as, local regulations in Mongolia. Detailed review of all applicable Mongolian laws, regulations and policies, as well as international performance standards and guidelines is provided in **Part II** of the **Social and Environmental Impact Assessment (SEIA)**.

Mongolian laws, regulations and state policies that are directly applicable to waste management include:

- Environmental Protection Law (1995, 2005);
- Municipal and Industrial Waste Law (2004);
- Toxic and Hazardous Chemicals Law (1995, 2006);
- Law on the Import, Export, and Cross-Border Transport of Hazardous Wastes (2000);
- Mongolian Law on Protection from Toxic Chemicals (1995);
- National Program on Waste Reduction (1999);
- National Program to Develop Quality Environmental Management Systems (2002);
- National Action Plan on Solid Waste Management (2002); and
- National Program on Environmental Health (2005).

International guidelines and standards that are applicable to waste management include:

- OPIC's Environmental Handbook (February 2004);
- IFC's Performance Standards on Social and Environmental Sustainability (April 2006);
- IFC's General Environmental, Health, and Safety Guidelines (April 2007);
- IFC's Environmental, Health, and Safety Guidelines for Mining (December 2007); and
- The Equator Principles (2006).

Per Mongolian regulatory requirements and applicable internal standards and guidelines, waste management facilities should be sited following a systematic process that includes consideration for alternatives and the environmental impacts associated with the sites and their access routes. Site investigation work should be conducted to determine the leachate migration potential and the need for engineering. The site should provide adequate buffer between existing developments and sensitive land uses or features. Facilities should be sited to the maximum extent possible away from areas subject to floods or fires.

Proponents must develop a program for the collection, handling and transportation of waste that is compatible with its service area. The program should incorporate some of the following features to provide environmental mitigation and promote public and employee health and safety:

- provide scheduled collections and awareness of the schedule;
- provide waste generators with appropriate refuse containers to segregate hazardous and non-hazardous wastes;
- ensure waste loads on haulage vehicles are covered;
- ensure that haulage vehicles are properly maintained;
- minimize waste handling; and
- include material recovery facilities for the project, where possible, to maximize diversion from disposal.

Waste management facilities must be designed to minimize impacts on air and water resources and may include gas and/or leachate control systems and appropriate separation distances, where appropriate. Facilities are to have separate receiving and handling areas for hazardous and non-hazardous wastes. Environmentally sound and contained storage areas must be available for materials that cannot be treated or disposed of immediately upon arrival at the facility. Waste is to be composted whenever possible.

Routine inspections should be carried out to ensure normal operation of the waste management facility. Once any defect is located, corrective actions must be taken immediately to avoid potential impacts on human health and safety or the environment.

Incinerator stack emissions must not exceed the following limits:

Parameter/Pollutant	Maximum Value
Particulate Matter	100 mg/Nm ³
Nitrogen Oxides (as NO ₂) – Oil Fired	460 mg/Nm ³
Sulfur Dioxide	2,000 mg/Nm ³
Dioxin	1 ng/Nm ³
Furan	1 ng/Nm ³

NO₂ – nitrite; mg – milligrams; ng – nanograms; Nm³ – Newtons · cubic meters

3.0 Waste Characterization

3.1 Definition of Wastes

A material is considered to be a waste when it can no longer be used for its original intended purpose. This WMP addresses all types of wastes expected to be generated on-site during construction and operations. Depending on its composition, waste can be either hazardous or non-hazardous.

Non-hazardous wastes are generated by the residential, commercial, institutional and industrial sectors and are also referred to as garbage, trash, and litter and generally do not provide any immediate health or environmental concerns in their handling. Hazardous wastes may adversely affect human health or the environment if they are not stored, handled, treated or disposed of in a proper manner. Hazardous materials may be categorized into one of five classes depending on their solubility, flammability, reactivity, toxicity and persistence.

3.2 Non-Hazardous Waste

Non-hazardous wastes anticipated for this project include: food waste from the camp; steel, aluminum, plastic and cardboard containers; glass; fabric; miscellaneous packaging; office waste and paper; scrap metals; inert building and demolition materials; maintenance facility and shop waste (e.g., wood pallets, filters; belts, bags and other containers); incinerator bottom ash; and sewage sludge etc.

Wastewater treatment sludge will be tested regularly to determine whether it may be landfilled in its untreated state or whether it requires lime addition. A list of typical domestic and industrial/commercial non-hazardous wastes generated by mining projects and the proposed handling and final disposal of are provided in **Table 1**. Non-hazardous wastes can be recycled or disposed without pre-treatment.

Except a small amount of overburden which will be stockpiled at the initial phase of dredge pond construction, all waste rock (including overburden and tailings) will be put back to the dredged side of the pond as concurrent reclamation proceeds during mining operations (see **Part I** of the **SEIA** for details).

All process water will be recycled and no discharge to surface water drainage is expected.

Table 1: Anticipated Non-Hazardous Wastes

Waste Type	Final Disposal	
	On-Site	Off-Site
Mixed Solid Waste		
Paint containers (any size, dry, empty)	Landfill	
Glass (containers, windows)	Recycle	
Packing material (Styrofoam, paper)	Landfill	
Aluminum and steel containers	Recycle	Sold to third parties
Non-oily fabric (rags, gloves, clothing)	Incinerator	
Plastic (all types, polywrap, containers)	Recycle/landfill	
Paper (all types)	Incinerator/composting/recycle	
Cardboard (boxes)	Incinerator/composting/recycle	Sold to third parties
Wood	Incinerator, chipper or landfill	Sold to third parties
Cables	Landfill	Sold to third parties
Conveyor belts	Recycle/landfill	
Tires	Landfill at designated location	
Construction debris	Recycle/incinerator/landfill	Recycled to third parties
Concrete	Recycling/landfill	
Scrap metal		
Drums	Recycling/landfill	Returned to supplier
Scrap iron	Recycling/landfill	Sold to third parties
Obsolete machinery	Recycling/landfill	Sold to third parties
Machinery parts	Recycling/landfill	Sold to third parties

The solid waste composition for the mining camp is anticipated to resemble the residential component of waste generated by a middle-income developing country whose wastes tend to have a significantly lower fraction of paper, plastic, metals, and glass, and a higher percentage of organic materials (mostly food wastes) and inert material (dirt, rocks, ash, etc.). Further, the camp waste is expected to have a moisture content of 50 percent or more and should be subject to rapid decay and decomposition during the summer.

Based on a review of the literature for select middle-income countries in similar climates, coupled with experience at similar mine sites, the composition of non-

hazardous waste at the Big Bend Project area is anticipated to resemble the breakdown provided in **Table 2**.

Table 2: Non-hazardous Waste Composition

Camp Waste	Operational Waste
20% Paper and Cardboard	35% Paper and Cardboard
5% Plastic	10% Plastic
10% Glass	10% Glass
5% Metal	5% Metal
50% Food and other Organic Waste	25% Food and other Organic Waste
10% Other	15% Other

Construction waste requires special attention because of its unique blend of materials. In general, the waste stream that is generated as a by-product of large civil projects including building of new structures is estimated to consist of 30 to 40 percent wood waste, 10 to 20 percent gypsum board, up to 10 percent cardboard, at least 10 percent masonry or concrete, 5 to 10 percent steel and up to 5 percent plastic. It should be noted that this waste blend is more typical of urban development and that mining related construction waste will differ somewhat. Also, wood wastes taken from construction and demolition have very favorable combustion characteristics and may allow for a better mixed waste stream for incineration.

3.3 Hazardous Wastes

Placer mining and processing does not involve the usage of chemicals or explosives and, therefore, a very small amount of hazardous wastes will be generated over the project life.

Hazardous wastes will be generated mainly in the maintenance shops and are generally expected to be composed of mineral oils and greases, used oil filters and batteries (dry and wet type including lead-acid). Contaminated soil from accidental spills of petroleum products could also become hazardous waste.

Although primarily associated with the industrial and commercial sectors, hazardous wastes may also be generated to a lesser degree at the mine camp through household products such as aerosol cans, cleaners, paints, cosmetics, batteries, etc.

Hazardous wastes will be properly segregated, labeled and stored in a properly secured location. There are no public or private hazardous waste disposal facilities in Mongolia. Hazardous materials will be stored, then disposed of by

incineration as may be permissible under Mongolian Law on-site, or transported to a future site for permissible disposal. Some potential may exist for disposal of hazardous wastes in high temperature kilns, asphalt and/or paving plants, power plants, boilers, or other facilities as may be in alignment with international best practices and approved by Mongolian authorities.

4.0 Waste Collection and Distribution

4.1 Waste Separation at Source

A number of secure communal refuse containers will be established at the camp, mine site, and shops for two separate waste streams; combustible and non-combustible wastes. A sufficient number of designated (labeled) steel type dumpster/roll-off containers and/or 220 liter drums will be placed at each location to provide daily removal of combustible waste (decomposable and other miscellaneous combustible wastes) and a potentially less frequent collection of other materials such as wood/yard waste, scrap metal, inert materials, and hazardous wastes. All containers shall be provided with suitable lids or covers to keep out precipitation and animals.

Particular attention will also be paid to emerging markets for recyclable materials. Solid non-hazardous waste requiring ultimate disposal in the sanitary landfill will be minimized through a conscientious source separation program using a multiple color-coded container system adopted elsewhere in the mining industry.

Three material-designated containers are envisaged to be introduced over the project life. Each will be identified by an individual color and will be used to pre-sort the material. Each container will be labeled and provide simple instruction (text and/or pictogram) on what is permitted and what is not, and all staff will be apprised of the importance of proper disposal during site orientation. Regular waste audits will be carried out throughout the project site to ensure that the separation system is adhered to. The general classification system is provided in **Table 3**.

Table 3: Potential Designated Waste/Material Containers

GREEN DRUM	- Glass containers of various colors
	- no bulbs, mirrors, windows or ceramics
	- remove all lids prior to disposal
BLUE DRUM	- Fiber
	- Newspapers, magazines, advertising fliers
	- Small cardboard boxes, egg cartons and paper bags
	- No Tetra-packs or dirty or waxed papers.

- Fold and flatten cardboard prior to disposal.
YELLOW DRUM - Metal and plastic containers
- Tetra-packs and plastic bags
- No rubber gloves or kitchen utensils

4.2 Waste Collection

Waste collection will evolve to meet the specific needs of the site development and operations as well as introduction of any waste diversion programs. The Environmental, Social, Health and Safety (ESHS) Manager will engage in a regular review of the collection method and routing to ensure that site needs are being met in the most efficient manner possible. Camp waste will be collected on a daily basis. The relatively high organic content of camp-generated waste may attract vermin or pose health hazards for the staff. All organics and combustible waste will be directed to the incinerator. Combustible waste will also be collected on a routine basis from the mining area, maintenance shops and clinic to supplement the camp waste for optimal use of the incinerator.

The remaining waste materials requiring disposal will also be collected on a daily basis while it is expected that inert materials and reusable and recyclable materials will require less frequent pick-up without creating environmental concerns. Depending on the material and the availability of local markets, such materials would only require alternate day or weekly collections, as required to keep the overall site appearance tidy. Staff within the camp, office and on the dredges will ensure that individual bins used in the separation of waste are consolidated on a daily basis to a pick-up point so that the needs of each waste/ material type can be properly addressed, both from temporary storage and collection viewpoints.

Once collection requirements are well established, a collection schedule will be developed that is adhered to and all site employees shall be made aware of this schedule in order to minimize vermin, odor and health and safety concerns associated with accumulated refuse.

4.3 Waste Haulage

The routing of collection vehicles is considered to be relatively straightforward for this project as all facilities generating waste are located along primary site roads. The on-site waste management facility and permanent landfill will be sited in close proximity to the mine camp.

A collection vehicle will pick-up the combustible waste from the mine camp, shops and mine site on a routine basis and delivers it to the incinerator. Any source separated recyclable materials will be picked up on an as required basis from the camp and mine site and hauled directly to the storage facility. The majority of the residual waste materials will be hauled to the permanent landfill

site. Once the site layout has been confirmed for the operational mine, a final routing map can be developed.

Trucks used to haul waste on-site will ensure that their waste loads are enclosed or tarped if they have an open top.

Hazardous materials that cannot be safely incinerated on-site will be initially collected in secure containers and directed to the on-site hazardous waste transfer depot for temporary storage. When accumulated volumes warrant their removal, these hazardous wastes will be hauled off-site to an approved treatment or disposal facility.

4.4 Waste Audit

It is recommended that waste audits be performed by the ESHS Manager on an annual basis to assess individual waste handling processes, facility sizing, actual waste generation rates and characteristics and the success of diversion programs.

The audit will study waste generation (quantity, composition, why and how) for the entire mine operation as well as its four primary components; the mine camp, the maintenance shops, and the dredges. When properly implemented, the audit will allow the waste generator to reassess the operation processes used to ensure that all is being reasonably done to minimize waste generation and that waste materials are reused and recycled to the extent practical.

The waste audits must address:

- any waste management facility or operational concerns;
- the amount, nature and composition of the waste generated in all functional areas of the operation;
- how the waste is produced, including relevant management policies and practices;
- how the waste is managed; and
- rate of volume depletion of the waste disposal facilities.

Additionally, a survey will be conducted at the same time that the waste audit is carried out to identify any new waste management initiatives that have been introduced by other similar facilities in the area or at the local municipality level. The goal of this survey is to identify emerging waste material markets and programs and contractors that this project could tie into to potentially reduce waste disposal requirements and waste management costs.

5.0 Waste Management and Disposal Facilities

Two distinct phases are envisaged for waste management, the first encompassing the initial construction and other start-up related activities, and secondly, the operational and closure period of the mine site.

A long-term landfill site and waste management facility will be established on-site to contain and manage wastes as soon as practical. The waste management facility will include the following components: a hazardous waste storage and transfer depot, an incinerator and a designated storage area for storing reusable and recyclable materials. Additional facilities will include a tire dump, an inert waste dump and a bioremediation area. Prior to construction of these long-term facilities, temporary waste disposal cells and a temporary hazardous waste storage and transfer facility will be established to provide interim management of hazardous and non-hazardous wastes at project start-up.

In general, all non-hazardous wastes will initially be sorted for reusable and recyclable materials that have established local markets or on-site uses. This activity is expected to increase over the life of the mine due to planned development of local recycling markets and as a result, the on-site facilities to support this will need to be expanded. The remaining waste streams will be managed by a combination of incineration and landfilling.

Hazardous wastes will initially, be stored temporarily on-site and incinerated as may be permissible under Mongolian law in accordance with international best practices. Some hazardous wastes may be transported off-site to an approved treatment/disposal facility when accumulated volumes warrant their removal. Since there are no hazardous waste treatment and/or disposal facilities in Mongolia at present, hazardous wastes generated at the Project area will be incinerated at a designated incinerator facility as may be available or on-site as may be approved. Some potential exists for disposal in high temperature kilns, boilers, power plants, asphalt plants and/or paving plants in alignment with international best practices. These disposal alternatives would have to be approved under Mongolian Law before being utilized.

5.1 Designated Recycling/Reuse Area

A designated recycling and reuse area (RRA) will be established as part of the waste management facility to support alternatives to disposal in the landfill. It will be located within the waste management facility adjacent to the incinerator.

This facility will receive recyclable and reusable materials from multiple collection points within the Project area and allow more efficient storage, consolidation and recycling.

5.1.1 RRA Design

The open-air area will consist of a small crushed gravel or concrete for the placement of a few roll-off containers and a larger graded clearing for the placement of larger amounts of bulked reusable material. Initially it is anticipated that roll-off containers for scrap metal, wood waste and brush would be made available in this area. Later in the operations period it is anticipated that the granular pad would be increased in size to accommodate additional bins for glass containers; newsprint/magazines/paper; and metallic and plastic containers consistent with the color-code containers for separation of waste types proposed in Section 4 of this WMP. The number of each type of bin will be adjusted depending on the rate of accumulation. All containers will be provided with covers to keep materials dry and free of vermin.

Inert construction and building materials will also be stockpiled if it is felt they can be reused during other construction works. For example, clean rubble will be placed in a well graded clearing and stored until it is needed for a particular construction activity.

5.1.2 RRA Operation

On-site environmental personnel will perform routine visual inspections of recyclables placed in the bins and stockpiled reusable materials on the ground. The purpose of the routine visual inspections is to look for prohibited waste, ensure that suitable sorting has occurred and to coordinate its timely transfer to its ultimate receptor. For example, when the bins reach 75 percent capacity, arrangements will be made to remove the material. Stockpiles of reusable material will be loaded by heavy equipment onto suitably sized trucks and relocated to on-site locations where such material can be reused or incorporated into a site process or undertaking.

Good housekeeping protocols will be followed in this area to keep it tidy and safe and minimize any co-mingling of materials. Stockpiles will be maintained with safe side slopes and heights. Suitable separation distances will also be kept between piles to provide easy access for inspection and fire control.

Training of site personnel will include, but not be limited to, the identification of acceptable and non-acceptable materials, fire control, the procedures to be followed for the logging of accepted inventory and carrying out inspections.

Regular inspections will be carried out for, among other things:

- the condition of the containers;
- the internal ‘tidiness’ of the operation and the prevention of unwanted inventory build-up; and
- any emerging nuisance concerns (e.g., litter).

No adverse environmental impacts (due to air emissions, traffic, odor, litter, noise, etc.) are foreseen with the operation of the proposed facility for the following reasons:

- the facility is expected to handle a relatively modest amount of materials; and
- such materials will not be hazardous, liquid or organic in nature.

5.2 Hazardous Waste Storage and Transfer Depot

A hazardous waste storage area will be constructed for the Project. Hazardous wastes will only be temporarily stored on-site and then either incinerated on-site, where appropriate, or transported from the Project site to a licensed treatment or disposal facility.

The depot will be used for the recovery of various wastes classified as hazardous, and will be located within the waste management area. The function of this facility is to consolidate waste from multiple collection points within the mine site and allow more efficient haulage to the final disposal site.

The depot will be divided into two sections (or stalls): one for the storage of hazardous materials which can be processed on-site (e.g., waste oil, fuels, etc.) situated closest to the incinerator and the other for the storage of hazardous wastes which must be disposed of or processed off-site. Waste stalls, closets, shelving and pallets for drums will be kept in this depot.

The hazardous waste storage will be gated and available only during normal operating hours or other appropriate hours. The gate will be locked during non-operating hours to prevent access to the facility.

On-site environmental personnel will perform routine visual and product inspections of the facility to ensure that there are no leaks in any of the drums, no spillage of material and to verify that the facility is in good working order. Containers will be inspected for defects and any circumstances that may pose a threat to human health, safety or the environment. Note of these observations will be made in the logbook and immediately take any corrective actions required. Any situation that poses an immediate threat to human health or safety will require the hazardous waste and hazardous materials storage facility to be closed until the situation is remedied.

Hazardous waste and materials will be stored in sealed steel or plastic drums or similar sealed containers. Hazardous waste and materials containers will be labeled according to the type of material and destination/origin.

5.3 Incinerator

Incinerators are commonly used at remote sites, including mining operations, to reduce the amounts of waste (non-hazardous) requiring disposal or waste (hazardous) transport off-site for treatment. An incinerator will be procured and installed during the construction period at the waste management facility.

The incinerator will be used to dispose of combustible waste materials from the camps, maintenance shops and mine site, and possibly a select list of hazardous wastes. Typical materials to be directed to the incinerator, include, but are not limited to the following:

- highly combustible waste such as paper, wood and cardboard;
- cartons, rags, combustible floor sweepings;
- organic food waste;
- animal carcasses; and
- industrial process waste such as contaminated diesel fuel and waste engine oils.

An incinerator will be selected that can effectively incinerate all potentially combustible materials in the anticipated non-hazardous waste stream and possibly waste fuels/oils and other hazardous wastes that are permissible for incineration. When the mine is fully operational, the incinerator will handle waste anticipated from the general mine operation including the mine camp, the materials storage area, and maintenance shop. During construction and closure phases, it is anticipated that waste wood and other combustible construction debris will also be diverted for incineration.

It is not anticipated that any significant pre-processing of waste will be necessary before being incinerated other than the source separation that is to occur at the camp and various mine facilities. Waste delivered to the incinerator will be tipped on the platform above the incinerator and inspected to confirm that the waste does not contain extremely wet organics (burn difficulties) or any heavy metals (emissions concerns). The incinerator operator will temporarily store any wet organics or surplus waste in the bunker to promote drying or maintain dry material. Items such as batteries will also be eliminated to the extent practical prior to pushing the waste into a top loading feed hopper.

Once combustion is complete, the residual ash can be removed and disposed at the on-site landfill.

While the incinerator has been designed to operate in a fully automated mode, regular supervision will be undertaken to ensure that operations are in accordance with the design specifications, and that operational settings (for air flow, supplementary oil supply, etc.) are refined for optimal performance.

5.4 Sanitary Landfill

A sanitary landfill will be constructed to receive domestic wastes from the mine camp, administration office, maintenance shop and the mine site, as well as incinerator ash.

No hazardous or toxic waste, raw sewage or untreated sewage sludge will be deposited in the sanitary landfill. Only residual solid non-hazardous waste that has not been targeted by waste diversion initiatives will be disposed of here.

Per World Bank guidelines and recommendations (World Bank, 2004: www.worldbank.org/urban/urbanforum2005/ulwpresentations/sw/paris.pdf), the following factors will be considered while designing, selecting and constructing the sanitary landfill:

- at least 300 meters from the Tuul River channel on the first terrace;
- isolated from all other environmental sensitive areas;
- avoid open areas of high winds;
- sufficient impermeable soil layer (more than 30 centimeters [cm] thick) at the base to protect groundwater quality (if the site location does not have thick enough impermeable soil, clay-rich soil will be brought in for the base construction) ; and
- sufficient soil cover (minimum 60 cm thick) for the closure.

The sanitary landfill footprint is considered to be conservatively sized as a result of contingencies built into a number of previously referenced waste management activities. Due to the uncertainty in waste quantities requiring disposal, the landfill will be developed in phases following a modular design approach, which allows the length of the landfill to be extended as necessary. Essentially each phase requires repetition of a uniform section. This will provide the owner with flexibility in terms of the area that has been set aside for waste filling, but does not commit them to constructing an oversized waste disposal site which may be unnecessary.

The sanitary landfill will rely on the natural attenuation/dilution (e.g., no containment or collection) of leachate. Surface water runoff from the landfill will be collected by perimeter ditches and directed away from the site.

No landfill gas control works are planned at this time given the relatively remote location of the landfill, the diversion of putrescible waste to the incinerator and the relatively small size of the site. Any gas produced will vent naturally through the landfill cover materials with no adverse public health effects. There are no on-site buildings situated near the sanitary landfill.

Only one working face will be open at any particular time for actual landfilling to allow effective control of nuisance factors. The landfill site will be inspected

routinely to locate any defect that may pose a threat to public health and safety or the environment. Corrective actions will be carried out immediately to avoid any potential negative impacts.

The use of a sanitary landfill waste disposal area in accordance with the proposed development plan will create a reasonable landform, one that is aesthetically acceptable within the existing topography.

Proper closure of the fill area will be undertaken once it has been landfilled to its design grades. A minimum 60 cm thickness of final clean earth cover will be placed over the compacted waste. The uppermost 15 cm will consist of topsoil or other available soil or organic media that can support naturalized vegetative growth over the landfill. Compaction of the cover will be sufficient to provide desired trafficability and erosion resistance while minimizing infiltration.

Mine Reclamation and Closure Plan

Social and Environmental Management and Monitoring Program

Big Bend Placer Gold Mining Project



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List of Abbreviations and Acronyms

GIS	Geographic Information System
HSE	health, safety and environmental
OPIC	Overseas Private Investment Corporation
SEIA	Social and Environmental Impact Assessment
T&E	threatened and endangered
USD	United States dollars



1.0 Introduction

This document details the Reclamation and Closure Plan for the Big Bend Placer Gold Mining Project, Mongolia. Careful planning of Project operations will minimize environmental impacts, and allow for successful reclamation results.

The general approach to reclamation efforts is as follows:

- Use nearly continuous reclamation approach with mining to ensure rapid reclamation and revegetation of disturbed sites;
- Support reclamation with modern soil conservation, erosion control, and contouring practices as required;
- Maximize use of natural revegetation and native species with the goal of improving the quality and biodiversity of the environment;
- Use designated access routes, avoiding multi-tracking impacts;
- Employ the field environmental checklist during reclamation to mitigate operational impacts;
- Use signage to mark reclaimed areas and prevent their disturbance;
- Conduct weekly impact mitigation briefings as part of the regular operational meetings for workers in order to maintain a high level of awareness on revegetation efforts;
- Apply principles of sustainability development and improved environmental biodiversity qualities; and
- Emphasize natural wildlife habitat improvements instead of agricultural uses.

1.1 Objectives

World Bank/IFC guidelines for mining require that the land is returned to conditions capable of supporting prior land uses or uses that are equal to or better than prior land use to the extent practical and feasible. The objective for the mine reclamation plan is to return the mined area to functioning ecological communities. Grading of overburden embankments (where feasible), replacement of topsoil and seeding of mined areas will enhance the process of natural site recovery such that the site will support the same types of land uses that currently occur in the region. It is not intended to return the mined site to pristine conditions, since human activities and impacts already exist within the Project area. However, the goal to achieve ecological functionality in the former mine site is considered achievable. Protection and improvement of steppe, riparian and wetland habitats is seen as a valid goal since these areas occur less frequently than steppe habitats that are dominant.

1.2 General Site Ecology

A detailed description of the general site ecology of the floodplain and adjacent areas of the Tuul River in the Project area is presented in the Social and Environmental Impact Assessment (SEIA) for the site (AATA, 2008).

1.3 Host Country Law

There are no codified specific requirements for reclamation under Mongolian law; therefore, the Project will follow the World Bank guidelines for mining. These guidelines require that the land be returned to conditions capable of supporting prior land uses or uses that are equal to or better than prior land use to the extent practical and feasible. Also, any significant adverse effects on adjacent water resources must be eliminated.

2.0 Reclamation History of Area

Since the initiation of mining in the region in the early 1990s, no formal reclamation of placer mines has been completed. It is the intent of this Project that mining and reclamation occur nearly concurrently so that the amount of disturbed, non-productive land is minimized throughout the life of the Project. Modern reclamation techniques will be utilized on the Project, which will help stabilize disturbed habitats and return them to ecological functionality, and a more enhanced biodiversity.

3.0 Closure and Reclamation Methods

There are several key points of the mining process that need to be considered in conjunction with the development of the reclamation plan.

Topsoil Stripping and Storage: Prior to the removal of overburden, suitable topsoil from all areas to be dredged will be stripped and stockpiled or directly hauled to areas being reclaimed. Also, any upland sites where overburden embankments will be created will first have the suitable topsoil stripped and stockpiled. The stockpiled topsoil will be used as the final cover material on reclaimed sites once the mining is completed or once the overburden embankments have been constructed. Since the topsoil on upland sites is somewhat different from the lower stream terraces, topsoil from mining sites will be used on the mined sites and topsoil from the embankment sites will be used on the embankments.

Mining Process: The proposed mining technique consists of a two-stage process which first removes the overburden and then mines the placer deposits. Since the overburden is finer than the placers, it is possible to move this material first and then deposit the finer dredged materials on top of the coarser mined placer tailings. As each of the dredge blocks is completed, the spoil piles within the dredge blocks themselves will be graded. Most of the overburden and dredged placer deposits will be replaced within the dredge blocks; however, because of the anticipated swell factor (1.3 times) some of the overburden will be placed in embankments on upland sites adjacent to the dredge blocks. These areas are anticipated to have relatively gentle slopes such that they can be successfully reclaimed. Side slopes on these embankments will not exceed 3:1 in steepness except in unusual circumstances.

Continuous and Concurrent Reclamation: The mining plan will allow for reclamation to be conducted as part of other annual activities on the site. Each year, portions of the site where the mining has been completed will be reclaimed rather than waiting until the mining is completed. This will reduce the amount of disturbed area present on the site at any time for the duration of the Project.

Careful scheduling of the implementation of civil reclamation activities needs to coincide with the optimal period for sites requiring revegetation. Estimated time for completion of civil work (i.e., dirtwork and grading) will coincide with the optimal revegetation period. Optimal revegetation period is variable for Tuul River floodplain willow thicket replanting of on-shore steppe areas. In the floodplain areas, civil dirtwork and grading will be completed in early spring to be followed immediately by planting of willow cuttings to take advantage of the period before bud break and the relatively cooler temperatures.

In steppe areas requiring revegetation, completion of civil dirtwork and grading will also be completed within a specific time window, from spring to mid-summer in order to take advantage of the growing season to allow optimal establishment of replanted areas.

Post-Mining Reclamation: After mining activities are completed, there will be a small amount of reclamation that still needs to be done on the remaining Project facilities (remaining dredge ponds, Mine Camp, workshop, and roads); the majority of reclamation work will have been completed by that time. Those facilities that will not be used after mine closure will be decommissioned and the area reclaimed. The intent is to create an enhanced habitat for wildlife and leave the site as a nature preserve.

3.1 Facility Salvage, Demolition and Disposal

After mining is complete, the dredges will be disassembled and moved to another location or sold. The support buildings/ facilities will be removed, including the foundations. The staging/process areas, support facilities areas will be graded and ripped, and then covered with topsoil. The seedbed will be prepared and the land seeded. All roads will be ripped to remove compaction, disked and then covered with topsoil and seeded.

3.2 Surface Grading

To the extent possible, most of the overburden and mine spoils (processed placer deposits) will be replaced within the individual dredge blocks. Because of the swell factor resulting from processing the materials, some of the mined materials will need to be placed on upland sites adjacent to the dredge blocks. In either case (upland or dredge block disposal), these areas will be graded and smoothed once the mining is completed in each block. The intent will be to create landforms that are consistent with surrounding floodplain areas. The intent is to create low, gently sloping areas rather than tall, steep-sided piles of cast material. Creating graded areas with gentle slopes will enhance the success of the revegetation plan. No slopes with grades greater than 3:1 will be created.

Grading can also be used to adjust the depth from the surface to the water table on the floodplain. In areas where willow shrubland plant communities will be created, the spoils will be graded so that adequate moisture will be available for these communities.

The created landforms will be somewhat different from the original topography on the floodplain because of the need to create embankments for disposal of the additional overburden resulting from the 1.3 swell factor. However, the natural geomorphologic characteristics of the floodplain will be maintained.

3.3 Sediment and Erosion Control

Since the Project area is located on the floodplain of the Tuul River, there are no steep slopes on the site. The most important issue related to sediment and erosion control is preventing sediment from the mining process from reaching the Tuul River. This will be accomplished by isolating the dredge blocks from the channel of the river and by assuring that all of the runoff from areas adjacent to the dredge blocks drains into the mining areas instead of draining into the river. Advanced soil conservation techniques such as filter fabric and silt fencing may be used where necessary. Overburden will not be placed on steep slopes.

3.4 Soil Salvage and Redistribution

Suitable topsoil will be stripped from all areas of anticipated disturbance including:

- Areas to be dredged;
- Areas where disposal embankments will be created;
- Any locations where support facilities will be constructed; and
- Any access roads or service roads within the Project area.

The evaluation of the quality and quantity of suitable topsoil to be stripped will be made by a qualified soil scientist.

Depending on the current status of site reclamation, the stripped topsoil will be placed in stockpiles or will be directly hauled to sites where mining has been completed. It is the intent to use the topsoil on sites that are comparable to the locations where the soil was originally stripped. Prior to placement of salvaged topsoil, all disturbed areas will be graded, smoothed or ripped as necessary. Stripping, stockpiling and respreading of topsoil is one of the best approaches for assuring the success of the revegetation plan.

3.5 Seed Mixtures

It is the intent of the Project to use native species for revegetation of the disturbed areas. To the extent possible, seed from commercial or governmental institutional sources will be used, however, it may be necessary to hand-collect seed from local sources. If some native species seeds are not available, commercial mixes will be utilized. WMMC will ensure that livestock grazing does not occur within the Project area by utilizing security officers and temporary fencing around facilities or as deemed necessary for successful revegetation. As reclamation of the site progresses, plants growing on the reclaimed areas can be used as seed sources. For upland areas, the focus of the revegetation plan will be to establish grasses, and for the lowlands and wetlands, appropriate riparian species will be selected.

For lowland areas, a similar mix of grass species will be used. In areas where the depth to water table is not too great, willow sprigs will be installed as a means of re-establishing riparian shrublands. Planting of cottonwood or elm (*Ulmus pumila*) may also be used to increase the structural diversity of the reclaimed lands.

3.6 Plant Propagation

At the current time, there are no plans to propagate reclamation plant materials for this Project. If commercial seed sources cannot be found, hand collecting of local materials will be used, or, if necessary, commercial mixes will be used. As the mining Project advances, it may be possible to collect seed from established reclaimed areas. It is anticipated that local hand labor sources will be available for these tasks.

3.7 Seedbed Methods

Suitable seedbeds will be created by first grading the dredge spoils and then resspreading stockpiled or direct hauled topsoil. After resspreading the topsoil, the areas will be disked in preparation for seeding.

3.8 Tree and Shrub Planting

Trees and shrubs will be planted on the lower portions of the reclaimed floodplain areas. Species of willow and elm will be planted in order to increase the diversity of habitats on the reclaimed areas.

3.9 Fertilizer Application

Reclaimed areas will be fertilized with inorganic fertilizers on an “as needed” basis. Addition of too much nitrogen fertilizer can cause substantial increases in annual weedy species. Application of fertilizer may be delayed until the beginning of the second growing season. With this schedule, more of the fertilizer will be utilized by seeded species rather than annual weeds.

3.10 Revegetation Trials

Since no revegetation of placer spoils has been conducted in this region, it may be appropriate to evaluate several different revegetation approaches. Successful revegetation may be obtained by drill seeding or broadcast seeding. Each of these approaches may be evaluated using a series of field demonstration tests. The preferred approach for revegetating disturbed areas may be determined on the basis of these field trials as well as on the basis of the availability of revegetation equipment. It is anticipated that the field trials will focus on relatively large areas rather than on smaller test plot sized areas.

3.11 Revegetation Monitoring

As part of on-going reclamation activities, areas that have been reclaimed will be evaluated relative to the success of the revegetation approaches and to the stated goals of the reclamation plan. Evaluations of total vegetation cover, species diversity and erosional stability will be conducted to determine if the revegetation plan has been successful in attaining the goals of establishing plant communities that will support the anticipated post-mining land uses of wildlife grazing and habitat. The monitoring approaches may be based on both qualitative and quantitative methods. Geographic Information System (GIS) will be used to track monitoring results.

4.0 Specific Mine Closure and Reclamation of Affected Areas

4.1 Dredge Ponds

Dredge ponds will be back-filled with tailings and overburden after mining is completed for each individual dredge block. The 1.3 swell factor will prevent contouring the landform to its original state, so care will be taken to minimize erosion and resulting river sedimentation. Reclamation will be conducted on the spoil area as the dredge moves on in the trench.

4.2 Dredge Move Canals and Spoils

Dredge canals will be backfilled using either the cast materials from the canals or using overburden materials. Once filled, they will be graded, contoured, covered with topsoil and planted using appropriate seed mixes of native species.

4.3 Tailings Piles

The two-stage mining process produces spoil piles that have mixtures of fine and coarse materials that can be regraded to create landforms consistent with other floodplain features. Most of the tailing materials will be replaced within the individual dredge blocks. The remainder of the material will be placed in embankments on upland sites adjacent to the dredge blocks. No un-reclaimed tailings piles will be left on the site at the end of the mining process. All of the disposal sites will be graded, topsoiled and reseeded. Some strategies will include grading the site so that wetland habitats can be created, contouring the material to

create landforms more suitable to wildlife, and simple grading and spreading of stockpiled topsoil to encourage plant growth.

Additional tailing reclamation strategies may include:

- Tailings and overburden piles will be constructed with the lowest slope angle as practical, and the top and toe will be rounded off.
- A portion of the sluice undersize will be pumped onto the top of the coarse section during dredging.
- To the extent possible, the contour and grade of the dredge tailings will be relatively flat.

4.4 Roads and Trails

At the end of the mining Project an evaluation will be conducted to determine if any of the roads and trails on the site will remain. Some of the roads may be necessary for site management during final site reclamation. All other roads will be reclaimed by first ripping the surfaces to eliminate compaction, placing cover soil on the roads and then seeding.

4.5 Processing and Ancillary Facilities

For Project facilities, the following guidelines will be used during closure/abandonment:

- All buildings, machinery, materials, fuel drums, used oils, unburied solid waste and metal waste will be removed.
- Compacted soil will be ripped, covered with topsoil and seeded.
- If certain structures will be reused in the future, these will be left on-site with the appropriate approval of the local authorities.

4.6 Domestic and Hazardous Waste Facilities

Solid and hazardous waste issues involve closure of on-site landfills, removal of hazardous waste off-site and closure of the facilities. The land will be graded as necessary, covered with topsoil and seeded.

5.0 Monitoring

The purpose for monitoring reclamation areas is to determine erosional status and vegetation development. This will provide information relative to the requirements for weed control or re-seeding. Identification of erosion problems could be used for developing procedures for preventing additional erosion (e.g., use of silt fence for trapping sediments). Another purpose for monitoring reclaimed areas is to evaluate the effectiveness of the revegetation procedures. This information can be used to optimize the approaches that are being used and also to make adjustments to seed mixes. Monitoring of concurrent reclamation efforts will be conducted by field evaluations of previously reclaimed areas once or twice a year during the growing season to evaluate erosional status and vegetation development.

Environmental monitoring of reclamation is important at two phases of Project operations: 1) implementation of the decommissioning, closure and abandonment plan in the Project concessions; and 2) a post-reclamation monitoring plan. All monitoring will be performed as a conformance assessment of the overall reclamation goals in accordance with the Overseas Private Investment Corporation's (OPIC's) Health, Safety and Environmental (HSE) standards. Local Soum Environmental Inspectors will be engaged to inspect at regular intervals.

5.1 Project Decommissioning and Closure Phase

A Project decommissioning and closure (abandonment) plan will require environmental and social monitoring of activities involved with the execution of various reclamation Projects associated with the Tuul River and floodplain and on-shore localities involved in the plan.

Biweekly illustrated progress reports with digital photographs will be prepared by the on-site environmental monitors and submitted via satellite link from the Project area to assist in resolving any field problems.

5.2 Post-Reclamation Phase

Following completion of reclamation activities and the monitoring phase associated with this, the goal of post-reclamation monitoring is to measure and document the success of all aspects of the overall reclamation plan both on the Tuul River and floodplain and on-shore in the area of the concessions. This monitoring phase, moreover, will provide management with valuable feedback on the success of the overall reclamation plan, in addition to identifying deficient areas where more remedial work will be required.

Field reports will also be prepared and transmitted quasi-real time via the internet to document actual on-site conditions and progress of reclamation in the post-reclamation phase.

5.3 Key Specific Monitoring Tasks

During the reclamation, decommissioning and post-reclamation phases of the Project life, five main components will require a detailed monitoring effort including:

- Site cleanup and closure of solid and liquid waste issues;
- Reclamation of erosion prone areas;
- Revegetation; and
- Threatened and endangered (T&E) species presence/absence.

Site Cleanup: Solid and hazardous waste issues will require cleanup as part of the decommissioning plan. Monitoring for full compliance of solid and hazardous waste facility closure and disposal issues is necessary to ensure compliance with standards of the Mongolian Ministry of Nature and Environment and OPIC.

Reclamation of erosion prone areas: Documenting of erosion control work and its progress will be an important part of the monitoring program. Erosion control and installing erosion control devices will be a significant part of the overall reclamation plan. Identification of erosion problems will be used for developing procedures for preventing additional erosion

Revegetation: Monitoring of the revegetation plan both during its application and during the post-reclamation phase is important in documenting the execution of the plan and the post closure success of the plan. Monitoring results can be used to optimize the approaches that are being used and also to make adjustments to seed mixes.

T&E Species: The presence/absence of T&E species in the Project area will be monitored both during the reclamation phase and periodically in the post-reclamation phase. Post-reclamation phase monitoring will be conducted by a team of specialized local and international biologists in areas of the Tuul River and floodplain and on-shore on the steppe grasslands of the Project area.

6.0 Implementation Schedule and Costs

6.1 Reclamation Schedule

Project plans call for reclamation of disturbed sites to be conducted as a concurrent activity with mining. Individual dredge blocks will be reclaimed concurrent with the mining activities. Seeding of reclaimed sites will mostly be done in the fall so that the seeded areas will be ready for growth in the following spring. Seedlings developing in the spring will be able to utilize soil moisture that has accumulated during the dormant season. Spring seeding may be used, if it is not possible to have areas seeded in the fall. The spring season will be used for planting trees and shrubs.

6.2 Reclamation Costs

It is anticipated that as much as 475 acres (15 percent of the Project area) may be disturbed by the Project. This includes mine areas, disposal sites and disturbances associated with ancillary features. Reclamation costs for this area could range between 1,470 and 4,440 United States dollars (USD) per hectare. Total costs could range between 384,000 to 1,152,000 USD. Cost estimates are based on what it might cost in the US. In the US, labor and equipment costs are probably higher, but most of the products and services needed for reclamation are readily available. In Mongolia, the labor costs are certainly lower, but availability of items like seed, mulch, fertilizer, etc. is uncertain, and will cost more if they have to be brought in from outside the area. If the reclamation work is conducted by mine personnel with equipment present on-site (tractors, graders, trucks, etc.) then the overall costs might be lower.

7.0 Public Involvement

Public involvement in the reclamation process may include the use of local labor to assist in the actual implementation of the revegetation plan. Activities like seed collecting, weed control, and hand seeding may be done by local people. As an added benefit, working on the reclamation site will be an environmentally preferable alternative to placer mining.

8.0 References

AATA. 2008. Social and Environmental Impact Assessment, WM Mining Company, LLC Big Bend Placer Gold Mining Project (Mongolia).