

 <p><b>ALMONTY</b> KOREA TUNGSTEN CORP. 알몬티코리아텅스텐(주)</p>	<p><b>Sangdong Mine</b> Non-Technical Environmental and Social Impact Assessment</p>	<p><b>AKTC-HSES-033</b></p>
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# ***Non-Technical Environmental and Social Impact Assessment***

## **AKTC-HSES-033**

### REVISION HISTORY

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<b>REVISION HISTORY</b> .....	<b>1</b>
<b>ABBERRIATIONS</b> .....	<b>3</b>
<b>1. INTRODUCTION</b> .....	<b>4</b>
<b>2. THE PROPOSED PROJECT</b> .....	<b>5</b>
2.1 HISTORICAL CONTEXT AND CURRENT STATUS OF THE PROJECT .....	5
2.2 SANGDONG DEPOSIT.....	5
2.3 EXCAVATION OPERATIONS AND INFRASTRUCTURE DEVELOPMENT .....	5
2.4 CONSTRUCTION ACTIVITIES .....	6
<b>3. INTERNATIONAL LENDER REQUIREMENTS</b> .....	<b>7</b>
3.1 INTERNATIONAL LENDER REQUIREMENTS .....	7
3.1.1 <i>Equator Principles</i> .....	7
3.1.2 <i>IFC's Policies and Performance Standards</i> .....	7
3.1.3 <i>Key requirements</i> .....	7
<b>4. METHODOLOGY</b> .....	<b>9</b>
<b>5. ENVIRONMENTAL AND SOCIAL BASELINE</b> .....	<b>10</b>
5.1 CLIMATE AND METEOROLOGY .....	10
5.2 TOPOGRAPHY, ELEVATION AND VEGETATION.....	10
5.3 HYDROGEOLOGY.....	11
5.4 SURFACE WATER .....	11
5.5 NOISE AND VIBRATION .....	12
5.6 BIODIVERSITY .....	12
<b>6. SOCIAL BASELINE</b> .....	<b>12</b>
6.1 SANGDONG.....	12
6.2 NEIGHBOURING LIMESTONE MINE (OMYA).....	12
6.3 CULTURAL HERITAGE .....	13
<b>7. ENVIRONMENTAL IMPACT ASSESSMENT AND MITIGATION</b> .....	<b>14</b>
7.1 AIR QUALITY .....	14
7.2 IMPACT ON LAND.....	14
7.3 GROUNDWATER .....	15
7.4 IMPACT ON SURFACE WATERS.....	15
7.5 WASTE ROCK CHARACTERISATION .....	16
7.6 BIODIVERSITY .....	16
7.7 NOISE AND VIBRATION .....	16
7.8 HEALTH AND SAFETY.....	17
<b>8. SOCIAL IMPACT ASSESSMENT AND MITIGATION</b> .....	<b>19</b>
8.1 OVERALL ECONOMIC IMPACT.....	19
8.2 JOB CREATION .....	19
8.3 WEALTH DISPARITY .....	19
8.4 HUMAN RESOURCE BENEFITS.....	20
8.5 IMPACTS ASSOCIATED WITH THE PURCHASE OF GOODS AND SERVICES .....	20
8.6 LABOUR MIGRATION.....	20
8.7 INCREASED BURDEN ON SOCIAL INFRASTRUCTURE .....	20

 <p>알몬티코리아텅스텐(주)</p>	<p align="center"><b>Sangdong Mine</b>  <b>Non-Technical Environmental  and Social Impact Assessment</b></p>	<p align="center"><b>AKTC-HSES-033</b></p>
---	--	--

8.8	LOCAL CONFLICTS .....	21
8.9	LAND USE IMPACTS.....	21
8.10	TRANSPORT OPERATIONS (RAW MATERIALS AND PRODUCTS) .....	21
8.11	CULTURAL HERITAGE .....	21
<b>9.</b>	<b>STAKEHOLDER ENGAGEMENT .....</b>	<b>22</b>
9.1	COMPANY EXPERIENCE IN STAKEHOLDER ENGAGEMENT .....	22
<b>10.</b>	<b>ENVIRONMENTAL MONITORING PROGRAMME .....</b>	<b>25</b>
10.1	PROJECT MONITORING.....	25
10.2	MONITORING LOCATIONS.....	25

## ABBREVIATIONS

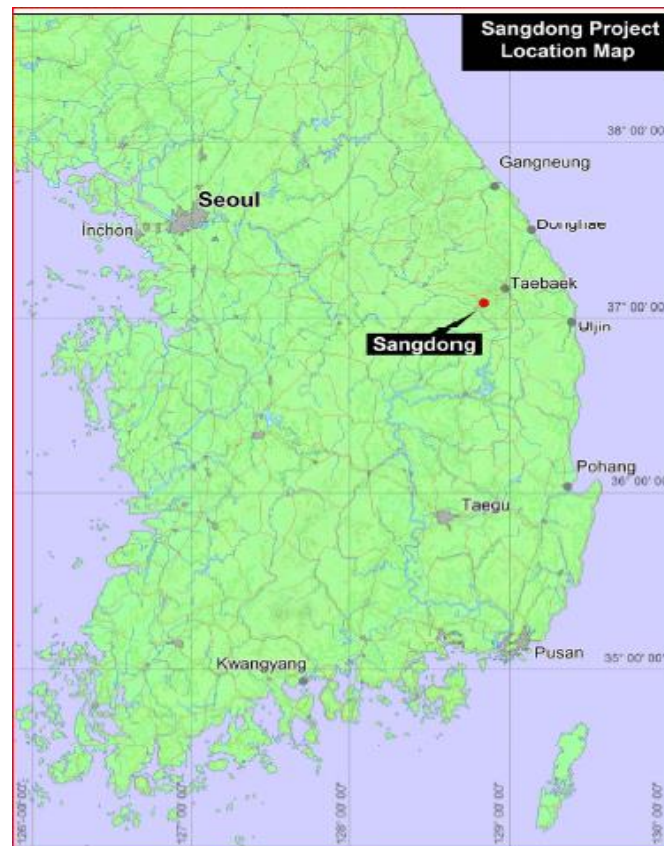
ESAP	Environmental and Social Action Plan
ESIA	Environmental and Social Impact Assessment
IFC	International Finance Corporation
SEP	Stakeholder Engagement Plan
APT	Ammonium paratungstate

## 1. INTRODUCTION

The Project is located approximately 175 km east-southeast of Seoul, in Yeongwol County of Gangwon Province in South Korea (Figure 1). Sangdong, a small rural village with a population of approximately 1,221, is situated 2 km to the south of the proposed mine. The nearest town is Taebaek with a population of over 47,000 residents, located 25km to the east by paved road and 55 km southeast of Wonju, the most populous city in Gangwon province, South Korea (Figure 1). The Taebaek to Naedeok Road runs adjacent to the mine site at Sangdong. This two-lane bitumen road provides access to the proposed operation for heavy machinery and road haulage transport.

During the life of the Project, it is anticipated to mine up to approximately 640,000 tonnes of ore per annum with associated waste-rock from underground operations with a projected mine life of 10 years (initial development stage).

Infrastructure for this project includes a mining plant (crushing, grinding and flotation concentrator), backfill plant, water treatment facilities, power station, workshops, offices, access roads and a waste rock dump with tails.



**Figure 1: Project Location**

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---	---	-----------------------------

## 2. THE PROPOSED PROJECT

### 2.1 Historical Context and Current Status of the Project

Since the ore deposit of Sangdong Mine was discovered at Sangdong in 1916, various companies ran small mining operations sporadically until 1952.

From 1952 onwards, the Korea Tungsten Mining Corp. operated the Sangdong Mine and produced scheelite concentrate, synthetic tungsten, Ammonium paratungstate (APT), and bismuth and molybdenum concentrates from 600,000 tonnes of ore per year until its closure in 1992.

However, the drop in tungsten prices forced the mine to reduce production from middle of 1980's and to shut down in 1992.

The present Project site covers 3,172 hectares (ha), and comprises twelve mining blocks.

### 2.2 Sangdong Deposit

Feasibility Study calculations have identified Probable Reserves of 7.9 Mt, which with an assumed mill capacity of 640 ktpa, will sustain a mining operation for approximately 12 years.

### 2.3 Excavation Operations and Infrastructure development

Excavation work from Alphones gallery will be progressed to develop main-level and sub-levels and access ramp before operational phase of the project.

In support of the project, it would be necessary to establish new plants and underground and surface facilities. The plant and facilities include:

- pilot plant,
- mining plant (crushing area, grinding area, flotation area),
- water treatment plant and drainage system,
- high voltage transmission and power distribution systems,
- ventilation,
- equipment maintenance, storage and support,
- other underground utilities, such compressed air and communication and process control systems, as necessary,
- a tailings storage facility;
- a waste management system; and
- Development of support infrastructure to support the mine and process plant activities (maintenance and repair facilities, equipment and material storages,

 <p><b>ALMONTY</b> KOREA TUNGSTEN CORP. 알몬티코리아텅스텐(주)</p>	<p><b>Sangdong Mine</b> <b>Non-Technical Environmental and Social Impact Assessment</b></p>	<p><b>AKTC-HSES-033</b></p>
---	---	-----------------------------

power distribution, accommodation and administration buildings, etc.).

## 2.4 Construction Activities

A range of new facilities would be constructed. These new surface facilities include the processing plant, the water treatment plant, the pilot plant and the tailings dam and underground facilities supporting the mining activities. The kind of activities that would be required for this construction include bulk earthworks and excavations, concrete batching, structural steel erection and cladding and electrical and mechanical installations. The underground facilities would require new areas to be excavated in order to house the support facilities.

 <p>알몬티코리아텅스텐(주)</p>	<p><b>Sangdong Mine</b>  <b>Non-Technical Environmental and Social Impact Assessment</b></p>	<p><b>AKTC-HSES-033</b></p>
---	--	-----------------------------

### 3. INTERNATIONAL LENDER REQUIREMENTS

#### 3.1 International Lender Requirements

The ESIA has also been prepared within the framework of Act on Environmental Policy, the proposed Equator Principles and International Finance Corporation (IFC).

##### 3.1.1 Equator Principles

The Equator Principles (EP) establish minimum requirements for environmental and social management and have been adopted by most large-scale financial institutions throughout the world. The EP apply to all new projects with total cost exceeding US\$10 million that have potentially significant environmental and social effects. The EP are also based strongly on compliance with the IFC's Performance Standards.

##### 3.1.2 IFC's Policies and Performance Standards

The IFC is a part of the World Bank Group; however, it has its own policies and standards pertaining to environmental protection, health and safety, and public disclosure. They are presented in the Environmental and Social Sustainability Policy and eight supporting Performance Standards and sector specific environmental, health and safety guidelines.

##### 3.1.3 Key requirements

The requirements at project stage for all three IFI's are detailed below:

###### 1) Environmental and Social Impact Assessment (ESIA)

The ESIA has the following objectives:

- Identify and assess both adverse and positive potential impacts of the project;
- Prevent or, if prevention is impossible, minimize, mitigate or compensate for adverse project impacts on staff, affected communities, and the environment;
- Ensure appropriate communication with the affected population on issues that may potentially affect living conditions of that population; and,
- Facilitate improved social and environmental performance of companies through implementing effective management systems.

###### 2) Environmental and social action plan (ESAP)

In order to ensure that findings and recommendations from the ESIA are properly implemented, it is necessary to develop an Environmental and Social Action Plan (ESAP). The ESAP should describe and prioritize all necessary social and environmental management requirements together with a cost and implementation timeline.

###### 3) Stakeholder Engagement

 <p><b>ALMONTY</b> KOREA TUNGSTEN CORP. 알몬티코리아텅스텐(주)</p>	<p><b>Sangdong Mine</b> <b>Non-Technical Environmental and Social Impact Assessment</b></p>	<p><b>AKTC-HSES-033</b></p>
---	---	-----------------------------

Stakeholder engagement is the cornerstone of the ESIA and is partly addressed in Korean regulations. For projects that might affect local population, the preparation of a Stakeholder Engagement Plan (SEP) is required in accordance with national requirements. The SEP details public consultation, disclosure of information, methods and timeframes of communicating information about risks of adverse impacts on local population and opportunity provided for engagement with such affected parties.



 <p>알몬티코리아텅스텐(주)</p>	<p><b>Sangdong Mine</b>  <b>Non-Technical Environmental  and Social Impact Assessment</b></p>	<p><b>AKTC-HSES-033</b></p>
---	---	-----------------------------

#### 4. METHODOLOGY

Because ESIA's are predictive processes undertaken before a detailed design of the project is available there is always data uncertainty. Information was provided by the mine, and also sourced from 2016 EIA report, monitoring conducted by the mine and relevant contractors, Internet searches and authorities. Information was also sourced during consultation processes. Impact significance was defined as a function of receptor sensitivity and the magnitude of the impact together with the probability of the impact.

 <p>알몬티코리아텅스텐(주)</p>	<p><b>Sangdong Mine</b>  <b>Non-Technical Environmental  and Social Impact Assessment</b></p>	<p><b>AKTC-HSES-033</b></p>
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## 5. ENVIRONMENTAL AND SOCIAL BASELINE

### 5.1 Climate and Meteorology

The Meteorological weather station nearest to the Project site is Yeongwol Weather Station. The Project experiences seasonal climatic conditions and at Yeongwol can be described as cloudy with a distinct hot wet season followed by a cold dry season during the winter.

The wet season from June to August, is hot and humid and 75% of the annual rainfall occurs during this period. Daily temperatures average 27°C and rise to a maximum of approximately 30°C. Daily thunderstorms are common in August and the occasional “typhoon” may occur in coastal areas.

During September to October, the climate becomes cooler, with daily temperatures reaching 20°C. The winter “dry” season lasts from October to March, with snow falling from December to February.

Freezing temperatures occur during this time, occasionally reaching as low as -30°C. Mild temperatures in the spring produce slush and muddy conditions on unsealed roads from March to April.

The average relative humidity is 68.10%, the maximum relative humidity is approximately 80.81% in July and the minimum relative humidity approximately 55.46% in April.

The average annual rainfall at the Yeongwol Weather Station is 1,261.52mm. The most rainfall is concentrated in the rainy season between June and August with approximately 904.7 mm of precipitation. The maximum monthly average rainfall is approximately 310.3 mm occurring in July. Snow accumulations can be as much as 1m between December and February.

The annual average wind velocity is 1.46m/sec and the range of the monthly average wind velocity is 1.20-1.95m/sec according to the observation data for a recent 10-year interval (1997-2006) in the Yeongwol area. The maximum average wind velocity is 2.34m/sec when the main wind direction is south-westerly. The average monthly daylight hours in the Yeongwol area are 175.5. The average daylight hours for the month of March are 209.7 hours, representing the maximum daylight hours in the year.

On average there are 129 freezing days each year, 112 days of rainfall and 106 frost days. Of these days, on average, each year there are 105 overcast days, 92 clear days, 29 foggy days, 26 snow days and 19 thunderstorm days.

### 5.2 Topography, Elevation and Vegetation

 <p>알몬티코리아텅스텐(주)</p>	<p><b>Sangdong Mine</b>  <b>Non-Technical Environmental  and Social Impact Assessment</b></p>	<p><b>AKTC-HSES-033</b></p>
---	---	-----------------------------

The Sangdong area is in the central portion of the most rugged part of the Taebaek-san in one of the deep valleys running North-south on the southern slopes of Baegun Mountain (Baegun-san 1,428m amsl). The highest outcrop of the Sangdong orebodies is about 800m amsl, the main adit is at about 650m amsl, and the old mine offices will be located on the floor of the valley at 550m amsl.

Many peaks in the Sangdong area, e.g. Sunkyeong-san (1,152mamsl), Maebong-san (1,282mamsl) to the SE and Jang-san (1,408mamsl) consist of Jangsan Quartzite and form long narrow ridges paralleling the axis of the Baegun-san Syncline. These peaks are separated by V shaped valleys in general, forming a dendritic pattern. However, the dominant trend of the valleys in the Sangdong mine area is north-south.

Despite the terrain, access is well developed countrywide and a paved road passes within several hundred metres of the old mill site and forestry roads traverse the Property. The highest local peak in the range is Taebaek-san, about 8km southeast of the Property.

Vegetation in the Taebaek district is dominated by dwarf pines. Thick dense undergrowth, consisting of scrubby thorny vegetation develops in June after the first heavy rains, making access very difficult off walking tracks. The scrub browns and dies out rapidly in October-November at the onset of winter.

### 5.3 Hydrogeology

The hydrogeological unit at Sangdong deposit and surround area is a complex of limestone rocks. The Ground water is expressed as springs where there is contact between the limestone and either skarn or shale. For example, there are three springs, near the old mine buildings where there is a limestone outcrop with a strike of approximately 300° and a dip of 80° north. Elsewhere to the west of the site, springs occur where there is contact between limestone and shale. Flows from the springs are in the order of 2 to 20l/s. Ground water varied in quality. Total coliforms were above the established quality criteria. Nitrates were also found in concentrations above the Korean drinking water standards. Exhaustive testing for arsenic in water during 2014 was performed and concentrations were found to be well within those for Korean drinking water standards. Elevated nitrate concentrations are likely to be a result of the application of nitrogenous fertilisers both for forestry and agriculture, while the heavily mineralised region around Sangdong will lead to elevated concentrations of arsenic in ground waters.

### 5.4 Surface water

Several permanent streams run through the site. These streams drain to Okdong Creek (chon), which flows through the town of Sangdong. The water is generally of good quality, based on the analytical results for “Living Environment” items (pH, biochemical oxygen demand, suspended solids, and dissolved oxygen). Water quality is classified as first grade at all sampling points except at one site where results for pH and suspended solids exceed the standards. However, analytical results for total coliforms (an indicator of

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potential human and animal waste present in water) were high 10-22,000 total coliforms/100ml. In accordance with these results, water quality is classified as fourth grade for the “Living Environment” standards. It is assumed that slash-and-burn-fields around the stream contribute substantially to total coliforms concentrations.

## 5.5 Noise and vibration

Sources of noise and vibration include the use of equipment, vehicles and mobile plant and blasting operations performed at the mine itself, as well as similar activities at adjacent industrial sites. Roadways are also sources of noise. Detailed monitoring of noise, vibration and EMR will be required to establish a comprehensive baseline.

## 5.6 Biodiversity

A total of 73 families, 165 genus, 183 species, 30 varieties, and 3 forma were identified from the site investigation in the project area and surrounding area.

The vegetation of the Project site is dominated by *Quercus mongolica* community with *Pinus densiflora*, and *Larix leptolepis* widely distributed in the total 16 investigation areas.

A large section of the area surveyed to the west of the mine site is under forest reserve and subject to logging at a later date. Areas which are designated first class conservation areas will remain as such to the west of the mine.

## 6. Social baseline

### 6.1 Sangdong

Sangdong is a town with a population of approximately 1,220 people in Yeongwol County, Gangwon Province, South Korea (“Sangdong”). Historically, for 70 years, the town supported a large mining community, upwards of 43,000 people. The economic base of the town has been literally dismantled since the closure of Sangdong Tungsten Mine in 1992 and also affected by general downturn of mining industry in the region. In the absence of notable industrial activities, Yeongwol County, the county which Sangdong is a part of, is now ranked as one of the poorest counties in Gangwon Province. The municipal budget self-sufficiency of Yeongwol County now stands at less than 30% making the County government rely heavily on the subsidies from the central government.

### 6.2 Neighbouring Limestone Mine (Omya)

Omya Sangdong Limestone Mine (Omya) is located about 450 meters from the current mine office of AKTC and 300 meters from the planned plant site. Its adit entrance is some 260 m northeast of the Sangdong adit with the workings in the hanging wall Pungchon Limestone situated above the northeast corner of the Sangdong Mine. Currently, Omya mining is mining down dip in the Pungchon Limestone at a rate of 150,000 tpa between

 <p><b>ALMONTY</b> KOREA TUNGSTEN CORP. 알몬티코리아텅스텐(주)</p>	<p align="center"><b>Sangdong Mine</b> <b>Non-Technical Environmental and Social Impact Assessment</b></p>	<p align="center"><b>AKTC-HSES-033</b></p>
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600 and 663 masl using the room and-pillar mining method. Omya’s operation in its Sangdong limestone mine is confined to blasting, carriage to the crushing plant on surface and transporting crushed and sorted limestone to its processing plant located 32 km from the mine. The workings are sufficiently far apart from the AKTC’s mine that they can work independently.

### 6.3 Cultural Heritage

A cultural property survey was conducted during July 2007 by ERM. Five cultural properties were identified in the “Cultural Asset Map Book” published by the Gangwon Regional Research Institute of Cultural Heritage around the Project site including two natural caves, a historical temple site, a fossil discovery, and a monument. These sites were surveyed to evaluate possible impacts.

All of the five cultural properties are outside the mine footprint and will remain untouched and unaffected.

 <p>알몬티코리아텅스텐(주)</p>	<p><b>Sangdong Mine</b>  <b>Non-Technical Environmental  and Social Impact Assessment</b></p>	<p><b>AKTC-HSES-033</b></p>
---	---	-----------------------------

## 7. ENVIRONMENTAL IMPACT ASSESSMENT AND MITIGATION

### 7.1 Air Quality

The area surrounding the proposed mine is predominantly forestry and agricultural land. The main sources of ambient dust in the region are likely to be due to grass seeds, pollens and wind erosion of exposed soil surfaces particular during tree harvesting.

Modelling of dust from the site originating from the waste rock storage facility, processing, and truck movements showed that dust increases were minimal in the community and will meet Korean air quality standards.

Air quality issues associated with this Project include:

- dust emissions associated with clearing vegetation, extracting and transporting small quantities of waste rock and ore, blasting and stockpiles
- dust emissions associated with the transport of ore via conveyor and stockpiling
- dust emissions associated with the crushing and milling processes at the ore processing plant
- windblown dust from erosion from disturbed and cleared areas on the Project site.

Mitigation strategies to minimize impacts of air emissions include:

- truck watering operations
- minimization of vegetation disturbance
- covers over conveyors and dust control as required.

### 7.2 Impact on Land

The soils in the Sangdong region are classified as hilly or mountainous soils with (acid) brown forest soils, red yellow soils and lithosols, loamy to clayey textured or loamy textured.

Land disturbance on the Project site may result in the following potential impacts:

- the temporary reduction of habitat for flora and fauna
- topsoil removal, loss, compaction or diminished viability
- soil erosion (wind and water).

Any land disturbance and rehabilitation on the Project site will be managed by:

- the appropriate rehabilitation plan for the Project and updated as necessary
- progressive rehabilitation to be conducted on the Project site leading to a reduction in water erosion and dust emissions with appropriate revegetation methods prior to the decommissioning of the Project

 <p>알몬티코리아텅스텐(주)</p>	<p align="center"><b>Sangdong Mine</b>  <b>Non-Technical Environmental  and Social Impact Assessment</b></p>	<p align="center"><b>AKTC-HSES-033</b></p>
---	--	--

- soil erosion control strategies will be implemented for all land to be disturbed or cleared.

### 7.3 Ground Water

Potential groundwater quality impacts from Project activities may include contamination of groundwater by process water spillage and chemical spills on site. Based upon a review of the water quality of the existing tailings dams, leachate from tails is expected to be of good quality. It should be noted that Sangdong does not own or have any liability for the old tailings dams. Mitigation strategies to minimise impacts on groundwater include:

- Monitoring of groundwater levels and quality at springs/established bores around infrastructure areas and the waste rock storage facility to determine background water quality and any change in quality that may be due to the Project operations;
- Clean-up of any process water or chemical spills immediately;
- All areas will be bounded to prevent any spills within the plant.

### 7.4 Impact on Surface Water

Several permanent streams run through the site. These streams drain to Okdong Creek, which flows through the town of Sangdong. The water is generally of good quality, based on the analytical results for “Living Environment” items (pH, biochemical oxygen demand, suspended solids, and dissolved oxygen). Water quality is classified as first grade at all sampling points except at one site where results for pH and suspended solids exceed the standards.

However, analytical results for total coliforms (an indicator of potential human and animal waste

present in water) were high 50 ~ 800 total coliforms/100 mL. In accordance with these results, water quality is classified as fourth grade for the “Living Environment” standards. It is assumed that slash-and-burn-fields around the stream contribute substantially to total coliforms concentrations.

Strategies to prevent degradation of the surface waters of the Project site include:

- Sediment settling dams to reduce the volume of sediment, derived from mined and disturbed land, from entering the natural river systems of the area
- Storm water will be diverted around mining operations as much as practicable, and where contact occurs with disturbed area, water will be collected, monitored, and treated as appropriate
- All spills of chemicals or fuels will be cleaned up immediately and contaminated areas remediated in accordance with the relevant guidelines and standards
- Any potentially acid forming material will be blended or encapsulated in the waste

 <p>알몬티코리아텅스텐(주)</p>	<p align="center"><b>Sangdong Mine</b>  <b>Non-Technical Environmental  and Social Impact Assessment</b></p>	<p align="center"><b>AKTC-HSES-033</b></p>
---	--	--

rock storage facility to prevent possible contamination.

## 7.5 Waste Rock Characterisation

The results of the waste rock assessment indicate the proportion of material which will be potentially acid forming is relatively small at approximately 10% of the total waste volume.

Historically, there has been no acid rock drainage from the existing well vegetated waste rock storage facility on site, or from the existing tailings dams. This trend is expected to occur, therefore during operations continuing assessment of all waste lithologies will be conducted to confirm if any potentially acid forming material is present and if required, this material will be encapsulated to reduce the likelihood of acid rock drainage.

## 7.6 Biodiversity

Based on the review of the 1st and 2nd investigation results, most of the observed species are commonly appeared species in Korea. However, the following two natural monument, designated by the Cultural Heritage Administration (CHA), and two endangered species, designated by Ministry of Environment (MOE), were discovered during the investigation.

- Natural monument: Kestrel (bird) and Chinese sparrow hawk (bird); and
- Endangered species: Common buzzard (bird) and *Damaster mirabilissimus Ishikawaet Deuve* (insect)

The observed birds are normally migrating to the non-impacted surrounding areas after the project initiation. And the insect, *Damaster mirabilissimus Ishikawaet Deuve*, was discovered in the neighboring area, not in the project area.

Therefore, it is judged that the impacts would be insignificant.

## 7.7 Noise and vibration

Several households at Sangdong are considered to be sensitive receptors that may be impacted upon by mine operations. Households located adjacent to the road network had noise readings 12 to 15 dBa higher than rural areas in the day and 6 dBa higher in the night.

Noise modelling of truck movements and the milling and processing activities showed a small increase of noise at the nearest community receptors, while still meeting Korean noise standards.

The mountainous terrain surrounding the mine acts a significant barrier to noise propagation assisting in noise reduction from the site.

The following mitigation strategies will be adopted by the Project to minimize noise from operations:



 <p>알몬티코리아텅스텐(주)</p>	<p align="center"><b>Sangdong Mine</b>  <b>Non-Technical Environmental  and Social Impact Assessment</b></p>	<p align="center"><b>AKTC-HSES-033</b></p>
---	--	--

- purchase mining equipment which favours noise reduction in design
- mine vehicles to be maintained in good condition to prevent unnecessary noise
- maintain diesel generators, lights, and other equipment in proper working order to prevent
- unnecessary noise being emitted.

The following mitigation strategies will be adopted to minimise impacts from blasting on the Project:

- blasting will be underground
- a blasting strategy will be maintained to meet vibration regulatory requirements.

## 7.8 Health and Safety

The safety system at the Project includes comprehensive training programs ensuring that all employees, contractors and visitors understand individual responsibilities in order to maintain a safe workplace environment. Sangdong Mine expects its employees to complete a JSA (Job Safety Analysis) prior to starting any new task; wear Personal Protective Equipment (PPE) and use the correct tools for the job.

The following requirements will be followed:

- All equipment to be certified every three months and to be regularly serviced and deemed operationally safe before use and will be installed with operational safety devices and operation procedures;
- All accidents and incidents, independent of their severity, will be reported to management;
- Risks will be identified, assessed and reduced wherever possible through the JSA approach;
- Regular audits of health and safety procedures are being and will continue to be undertaken, to ensure all procedures are being followed by employees and to implement changes/improvements when require; fire prevention and safe work practices.

Safety procedures put into place by the mine will include:

- Detailed instructions of responsibilities of all employees, contractors and visitors in order to maintain a safe workplace;
- Where appropriate, personnel shall undergo an assessment to ensure their fitness to work including drug and alcohol programme to ensure all workers are fit to commence work;
- Personal protective equipment, including clothing and devices, will be provided and properly used;
- Standard work procedures will be developed for tasks where potential risks may occur;
- Procedures will be implemented to ensure adequate monitoring of workplace

 <p>알몬티코리아텅스텐(주)</p>	<p align="center"><b>Sangdong Mine</b>  <b>Non-Technical Environmental  and Social Impact Assessment</b></p>	<p align="center"><b>AKTC-HSES-033</b></p>
---	--	--

conditions including but not limited to, noise, inspirable and respirable dust, silica and other chemicals used within the site;

- Ensuring that all personnel will have relevant certificates, licences and authorisations for the tasks included in their work duties;
- Implementation of emergency procedures;
- Clearly stated objectives of the health and safety procedures; and
- Clearly stated safety rules which will include site specific road and traffic rules.

 <p>알몬티코리아텅스텐(주)</p>	<p><b>Sangdong Mine</b>  <b>Non-Technical Environmental  and Social Impact Assessment</b></p>	<p><b>AKTC-HSES-033</b></p>
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## 8. SOCIAL IMPACT ASSESSMENT AND MITIGATION

### 8.1 Overall economic impact

The mine's significant social aspects include the creation of new jobs, career development, improved human resource capacity, procurement of goods and services, development of infrastructure, tax revenues, land acquisition and social partnerships. These aspects are expected to have benefits for Sangdong town and Yeongwol as a whole and the project area in particular as well as adverse effects. The Sangdong deposit is the largest tungsten deposit in the world. Sangdong town is considered among the top priority regional projects for the Yeongwol County where the benefit significance is also rated as moderate with a large benefit to the regional economy.

### 8.2 Job creation

Employment in Sangdong Town in 2015 was shared by manufacturing, educational service, public administration, defence and welfare, building industry, wholesale and retail and mining. A total of 225 people were employed in Sangdong. Together these industries provide approximately 80% of the employment in Sangdong Town.

Mining in the region has been of great importance, with over 40,000 people living in Sangdong Town when the mine was in full operation. During 2000 to 2010, mining was still undertaken within the area of Yeongwol County; however the number of those employed by the mining sector has been decreasing. The number of coal mines, usually a large employer of miners, has declined from nine operating mines in 2000 to none in 2009. A small number of active mines still exist; these tend to be small quarries and other small operating mines requiring only a reduced workforce.

Therefore, it is expected that the Sangdong mine project would create plenty of jobs not only in local area but also within the area of Yeongwol County.

### 8.3 Wealth disparity

Approximately 45% of households have no income and income earners comprising self-employed (24%), pensioner (17%), employer (8%) and day labourer (6%). Over 50 % of the income earners attended only elementary school; 16% to middle school; 24 % to high school and 6% to college and to university. Monthly incomes are: less than 1 million KRW (83%), 1~1.5 million KRW (12%), 1.5~2 million KRW (3.5%), 2~3 million KRW (2%) and over 3 million KRW (0.5%).

The region is declining with poor opportunities for young people. The quality of housing is declining as the populations ages, education levels are low among the population surveyed and nearly half of the residents surveyed appear not receive an income. Income levels are low. This trend is likely to continue without the establishment of new industries

 <p>알몬티코리아텅스텐(주)</p>	<p><b>Sangdong Mine</b>  <b>Non-Technical Environmental  and Social Impact Assessment</b></p>	<p><b>AKTC-HSES-033</b></p>
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with employment opportunities to support these declining communities. These results are very similar to those recorded in the 2007 survey indicating that there has been little change in the socio-economic conditions of the people of Sangdong.

Therefore, while an increase in income for residents is positive, there is a risk of price inflation for goods and services. People who do not get work at the mine will be negatively effected by the price disparity especially the vulnerable (the elderly, single parent families and families with many children). The effect is likely to be more pronounced at local level than at district level and mitigation will be required to keep the impact at no more than moderate.

#### 8.4 Human resource benefits

An opportunity exists to target young people for work at the mine so as to reduce out migration by the youth provided that there is adequate training and career development. Impact magnitude is considered slight but could be enhanced through additional interventions especially a progressive human resources policy.

#### 8.5 Impacts Associated with the Purchase of Goods and Services

The increased spending brought about the Sangdong mine project will see increased sales, improved profitability, potentially improved quality of goods and services, and other economic benefits. These benefits would serve to further improve indirect business activities as well but the impact significance is still considered no more than slight.

#### 8.6 Labour Migration

The demand for skilled personnel is likely to result in in-migration to the area by work-good working relationship with the local residents is essential and well thought through interventions could even result in positive impacts. A balance will need to be found between drawing in workers from outside the area and capitalising on the existing labour pool though education and training. Workers will be accommodated in a temporary on-site settlement during the construction phase but there will be a permanent dormitory established for the operations phase. Houses are also available in the village and new houses will also be built.

#### 8.7 Increased burden on social infrastructure

Labour migration will increase the demand for social infrastructure including:

- Hospitals;
- Houses
- Existing leisure centres, libraries, sports and other facilities.

It is in Sangdong's interest to provide whatever support it can to the continued development of such facilities so that they are adequate for the influx of people to the

 <p>알몬티코리아텅스텐(주)</p>	<p><b>Sangdong Mine</b>  <b>Non-Technical Environmental  and Social Impact Assessment</b></p>	<p><b>AKTC-HSES-033</b></p>
---	---	-----------------------------

village. A good working relationship with the local residents is essential and well thought through interventions could even result in positive impacts.

## 8.8 Local Conflicts

Since the inception of the mine development in 2006 by Oriental Mineral, the predecessor of AKTC, there has been no record of local conflict experienced by AKTC. Moreover, the local community has welcomed the Almonty's acquisition and provided overwhelming support to the mine development.

## 8.9 Land Use Impacts

The proposed mine development will not require any additional land as the project develop on exist mine site.

## 8.10 Transport Operations (Raw Materials and Products)

Cargo traffic will not affect the Sangdong settlements directly and with the distance to the settlements, the receptor sensitivity is assessed as low; with magnitude and significance minor and slight, respectively. However, speed limit is essential for the safety of the residents.

## 8.11 Cultural Heritage

A number of tombs are located near the Project site and have been identified and mapped. No disturbance to these tombs will occur. All the tombs are located on the other side of the mountain and remote from the mine site. There is no tombs between the village and the site or adjacent to the site with potential disturbance from the mine activities. Only potential disturbance to the tombs on the other side is when Sangdong Mine proceeds surface drilling near those tombs.

Although the probability of surface drilling is low given that all the future drilling for additional resource identification is planned to take place underground inside existing stope and galleries, there exists some possibility of surface drilling in the medium to long term exploration plan.

 <p>알몬티코리아텅스텐(주)</p>	<p><b>Sangdong Mine</b>  <b>Non-Technical Environmental  and Social Impact Assessment</b></p>	<p><b>AKTC-HSES-033</b></p>
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## 9. STAKEHOLDER ENGAGEMENT

### 9.1 Company Experience in Stakeholder Engagement

Stakeholder engagement that has occurred to date can be broadly broken down into two categories: regular engagement with host communities; and engagement related to the environmental and social permitting of the Project. Two tables are provided below - the first providing a summary of the engagement activities which have occurred within the Sangdong Town throughout the exploration and project preparation stages. This engagement has focused on building and maintaining an amicable relationship with the Sangdong community and other stakeholders. Through these meetings and engagement activities, AKTC (Woulfe Mining until 2014) has presented information on the Project and its activities on a regular basis and has sought feedback from the stakeholders on their views and concerns.

**Table 1: Stakeholder Engagement Programs (Sangdong Town)**

When	Subject	What
<b>2012</b>	Community (SD)	Presentation to Sangdong Residents on Sangdong Tungsten Mine Redevelopment Project
		Hosting and participating in Sangdong Sports Day with Sangdong JC
		Demonstration of Emergency CPR operation to the Sangdong Village people
		Donation and participation in Ritual Tungsten Rock Festival in Sangdong
		Granting accolade to Sangdong based employees
		Financial aids to local associations (Sangdong Prosperity Associations, Senior Citizens, Women's Association, Alumni Association, etc.)
	Schools	Signing of Academic-Industry Cooperation Agreement between Yeongwol Industrial High School and Sangdong Mining in the Office of County Mayor
Scholarship endowment to Sangdong Elementary, Middle-High Schools		
Execution of Industry-Academy Collaboration Program with Sangdong High School for priority employment of graduate students and scholarship for students advancing to resource major departments in college		
<b>2013</b>	Community	Participation in Yeongwol County Sports Day representing Sangdong Town
		Donation and participation in Ritual Tungsten Rock Festival in Sangdong
	Schools	Scholarship endowment to Sangdong Elementary, Middle-High Schools
		Invitation and OJT education for Sangdong High School students
<b>2014</b>	Community	Donation and participation in Ritual Tungsten Rock Festival in Sangdong

 <p>알몬티코리아텅스텐(주)</p>	<p><b>Sangdong Mine</b>  <b>Non-Technical Environmental  and Social Impact Assessment</b></p>	<p><b>AKTC-HSES-033</b></p>
---	---	-----------------------------

		Improvement of water supply facility and extension to the access area of the site and village by mutual cooperation with Yeongwol County
		Financial support for the sports event of Sangdong village foreman
		Gifts and food sponsorship for the autumn sports events of Sangdong Elementary, Middle-High schools
2015	Community	Donation and participation in Ritual Tungsten Rock Festival in Sangdong
		Open session with Sangdong representatives and associations hosted by the new management, Almonty Industries
		Financial supports for the sports event of Sangdong Village foremen
		Participation and donation to the opening ceremony of Sangdong Seniors College
		Charity activities for financially distressed neighbors in Sangdong Town (Rice and briquette donation)
2016	Community	Sponsorship for the sports event of Sangdong Voluntary
		Donation and participation in Ritual Tungsten Rock Festival in Sangdong
		Financial support for the sports event of Sangdong voluntary fire guards
		Donation to Sangdong Senior College for annual cultural activities
		Charity activity for the needy neighbors in Sangdong (Rice donation)
	Schools	Support for Sangdong/Yeongwol's education plan for establishment of 'Meister School' (Vocational Training School for Energy and Resources)
		Scholarship Endowment to Sangdong Elementary, Middle-High schools
2017	Community	Financial aids for the cultural and sports activities of Sangdong Seniors College
		Financial support for the sports event of Sangdong voluntary fire guards
		Donation and participation in Ritual Tungsten Rock Festival in Sangdong
	Schools	Scholarship Endowment to Sangdong Elementary, Middle-High schools
		Open Day for mine safety and resource extraction for students of Sangdong Middle-High Schools
2018	Community	Donation to Sangdong Senior College for annual cultural activities
		Subsidy for the Sangdong Sport Day activities hosted by Sangdong Alumni Association
		Participation in Danjong Festival, donation to Sangdong Women's Association's activities in the Festival
	Schools	Scholarship endowment to Sangdong Elementary, Middle-High Schools

**Table 2. Stakeholder Engagement Programs (Yeongwol County Area)**

When	Subject	What
2012	Government	Presentation to Mayor of Yeongwol County and the Department of Mine Development regarding the status of the Project and progress
		Invitation of Congressman of Yeongwol County and the members of

		Gangwon Provincial Council to the site and provision of project update and prospects
		Initiation of the campaign for population increase in Sangdong and Yeongwol County by transferring residence registration of staff and contractors to Sangdong Town
	Community (YW)	Donation to and participation in the King Danjong Festival of Yeongwol County
2013	Community (YW)	Donation to and participation in the King Danjong Festival of Yeongwol County
	Contractor and Institution	Invitation of representatives of resource industry/businesses in Yeongwol (e.g. POSCO-MTECH) to the site and provision of project update
	School	Open session for education of mine safety and resource extraction for students in Yeongwol
2014	Contractor and Institution	Building a mutual and technical cooperation with Yeongwol Eco-Materials Industry Foundation established by Yeongwol County
	Government	Participation in the extension of water supply to Sangdong village points and the site through mutual cooperation with Yeongwol County Government
		Invitation of Mayor of Yeongwol County and the Department of Mine Development to the site and provision for project update
2015	Contractor and Institution	Applying to the national research fund regarding mineral processing with Yeongwol Eco-Materials Industry Foundation established by Yeongwol County and planning the pilot plant campaign
	Government	Official meeting and project discussion between Mayor of Yeongwol County and the new management of Almonty Industries
	Community (YW)	Donation to and participation in the King Danjong Festival of Yeongwol County
	School	Participation in and support to Yeongwol County's campaign for the establishment of Meister School and provision of Sangdong Mine as a vocational training site
2016	Government	Open discussion and updating of the project status with Mayor of Yeongwol County by Almonty senior management headed by Antonio Correa de Sa
	Community (YW)	Donation to and participation in the King Danjong Festival of Yeongwol County
	Contractor and Institution	Participation in the Annual Forum organized by Yeongwol County as representative speaker (resource sector)
2017	Community (YW)	Donation to and participation in the King Danjong Festival of Yeongwol County
	Contractor and Institution	Participation in the Annual Forum organized by Yeongwol County as representative speaker (resource sector)
2018	Government	Open discussion and updating of the project status to Major and relevant department heads of Yeongwol County
	Community (YW)	Donation to and participation in the King Danjong Festival of Yeongwol County



 <p>알몬티코리아텅스텐(주)</p>	<p><b>Sangdong Mine</b>  <b>Non-Technical Environmental  and Social Impact Assessment</b></p>	<p><b>AKTC-HSES-033</b></p>
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## 10. ENVIRONMENTAL MONITORING PROGRAMME

### 10.1 Project Monitoring

Monitoring is a key requirement for effective environmental and social impact management and so a monitoring programme has been developed in the ESIA for the Sangdong Project. The monitoring programme includes both the integrity of structures such as the tailings facility and the waste rock dumps, as well as environmental quality. Provision is made in the monitoring programme for:

- Air quality
- Diesel Particulate Matter
- Waste Water
- Hazardous Material
- Biodiversity
- Noise and Vibration
- Spill Prevention and Containment

### 10.2 Monitoring Locations

The following monitoring will be progressed:

- Mine underground water condition
- Effluence water from water treatment plant
- The Gurae Stream and its upper stream near the site
- Hazardous Material Management
- Environmental aspects (emissions, discharges, waste, disposal, noise, vibration and so forth), lighting regime of construction sites and access roads during the day and night during construction, operations and mine closure.