

# ENVIRONMENTAL AND SOCIAL ACTION PLAN

*Version E*

## ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

### SHALKIYA MINE EXPANSION PROJECT (KYZYLORDA REGION, KAZAKHSTAN)

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**Prepared for:**  
**Hatch Engineering and Consulting (Hatch)**  
**JSC ShalkiyaZinc LTD**

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## ISSUE AND REVISION RECORD

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A	16 November 2015	Marina Khotuleva, Ph.D. Sean O'Beirne Tatiana Laperdina, Ph.D. Tatiana Strizhova, Ph.D. Vladimir Chechetkin, Ph.D.	Marina Khotuleva, Ph.D. Maia Gachechiladze-Bozhesku, Ph.D.	First draft for Hatch and JSC ShalkiyaZinc LTD comments
B	24 November 2015	Tatiana Laperdina, Ph.D. Marina Khotuleva, Ph.D. Tatiana Strizhova, Ph.D.	Marina Khotuleva, Ph.D. Maia Gachechiladze-Bozhesku, Ph.D.	Second draft for internal use of JSC ShalkiyaZinc LTD
C	29 January 2016	Tatiana Laperdina, Ph.D. Marina Khotuleva, Ph.D.	Marina Khotuleva, Ph.D. Maia Gachechiladze-Bozhesku, Ph.D.	Final document for internal use of JSC ShalkiyaZinc LTD
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## 1. INTRODUCTION

JSC ShalkiyaZinc LTD ('the Owner' or 'the Company') is proposing an expansion of the Shalkiya Mine as part of the Shalkiya Lead-Zinc Expansion Project ('the Project'). The Project is located in Kyzylorda Oblast (Region), in the south of the Republic of Kazakhstan (RK). The Project entails an expansion of operations of the existing Shalkiya Mine and the construction and operation of a new Processing Plant and supporting surface and underground infrastructure.

External investments are required to implement the Project, and to this end, the Owner plans to approach the International Financial Institutions (IFIs). Developing a Feasibility Study (FS) and Environmental and Social Impact Assessment (ESIA) as per the IFIs requirements is necessary to support the IFIs funding-related decision making process.

The FS to the IFIs requirements has been undertaken by Hatch. The ESIA has been prepared by the Ecoline Environmental Assessment Centre ('the Ecoline EA Centre') and SE Solutions (jointly, 'the ESIA Consultant'), with the support of Hatch.

Before and during construction, and then throughout operation of the Project, the Owner will need to implement a series of actions to avoid, reduce, or otherwise control potentially significant environmental and social impacts identified in the ESIA to ensure compliance with the IFIs' requirements. Actions proposed for the planned Project are presented in this document that is entitled "Environmental and Social Action Plan" (ESAP).

Implementation of all of the actions will be the responsibility of the Owner. When other companies perform work on behalf of the Owner under contract, the Owner will be responsible for those contractors' compliance with the relevant ESAP requirements. This is expected to be accomplished by inclusion of the relevant ESAP requirements in agreements with contractors, and by direct oversight and supervision by the Owner of contractors and sub-contractors.

## 2. ENVIRONMENTAL AND SOCIAL ACTION PLAN

The below ESAP (**Table 1**) is based on the findings from the ESIA and identifies the required actions, the basis of the requirements, the timing when the actions have to be implemented and/or completed, the responsibilities and required resources, and the criteria to be used for determining whether the required action has been successfully achieved.



**Table 1. Environmental and Social Action Plan (ESAP)**

	<b>Activity</b>	<b>Environmental or Social Risk or benefit</b>	<b>Requirement</b>	<b>Resources / Responsibilities</b>	<b>Timetable</b>	<b>Target / Evaluation Criteria</b>
<b>1. Environmental and Social Management System</b>						
1.1.	Develop and maintain an Environmental, Health, Safety and Social (EHSS) management system an organisational structure that defines roles, responsibilities, and authority to implement the ESAP. This should also include EHSS capacity building.	All mine expansion related environmental and social risks	EBRD PR 1 / IFC PS1; ISO 14001 and OHSAS 18000 standards (good practice)	JSC ShalkiyaZinc LTD's resources	Organisational structure to be in place prior to evaluation of bids	Completed job descriptions and appointments  Trainings conducted and training records
1.2.	Develop and implement a Contractor Management Programme that ensures that all contractors and sub-contractors working on the project are held to the Project's EHSS commitments, including Lender Performance Requirements.	Contractors are unlikely to be aware of the environmental and social risks of the project and/or the conditions of loan or equity arrangements.	EBRD PR 1; Good construction practice	JSC ShalkiyaZinc LTD and selected contractor	All completed prior to onset of bidding and contracting process associated with Project execution.	Completed contract documentation and evidence of the same in contracting process, as well as contractor monitoring.
1.3.	Develop and disclose the Hiring Policy. Continue/develop the dialogue with the local community on this basis.	Risk of unwarranted expectations amongst local people of jobs that may be created	EBRD PR2 / IFC PS2	JSC ShalkiyaZinc LTD's resources	2016, Q4	Hiring Policy developed and disclosed (e.g., published on the Company's website)
1.4.	Develop and implement Human Resource (HR) Policy.	Clear statements of the equal opportunities and safe working conditions to all personnel	EBRD PR2/ IFC PS2; RK Legislation	JSC ShalkiyaZinc LTD's resources	2016 and implement further	HR Policy approved
1.5.	As a part of EHS management system, develop and implement OHS programmes (including specific personnel training, occupational health assessments, behavioural considerations, use of Personal Protection Equipment, etc.)	OHS risks	EBRD PR2 / IFC PS2; RK legislation	JSC ShalkiyaZinc LTD's resources	2016-2017 and implement onwards	OHS programmes developed and operationalized



	Activity	Environmental or Social Risk or benefit	Requirement	Resources / Responsibilities	Timetable	Target / Evaluation Criteria
<b>2. Mine Design and Revival Stage</b>						
2.1.	Conduct OVOS of all Shalkiya Mine development projects within the framework of national design. Include the ESAP actions into the Environmental Protection Plan (prepared as per national law)	Compliance with EHS requirements of the IFIs and RK legislation	EBRD PR1 / IFC PS1; IFC EHS Guidelines for Mining; Legislation of Kazakhstan	JSC ShalkiyaZinc LTD's resources	2016-2017 and implement the Plan further on	OVOS materials for underground mining and construction of the processing plant prepared in line with the RK and IFIs' requirements and approved by the RK State Expert Review Authority
2.2.	Ensure the application of best available technology (BAT) when developing detailed design projects for the mine and processing plant	Improved performance in terms of resource efficiently and OHS.	EBRD PR 3 / IFC PS 3	JSC ShalkiyaZinc LTD's resources	Design stage	ESIA and BAT-design decisions in the detailed designed of the mine and processing plant
2.3.	Develop and implement a detailed Waste Management Plan that covers all waste types from the mine including legacy demolition rubble and construction wastes (including wastes newly generated from dismantling of buildings and structures)	Risks posed by wastes and visual impact	IFC PS1 & PS 3 / EBRD PR 1 & PR3 Legislation of Kazakhstan	JSC ShalkiyaZinc LTD's resources	During mine operation recovery and then at the stage of construction and operation activities	Clean industrial site and adjacent areas Monitoring schedule of the ecological state of industrial sites. A report on the re-use of construction waste



	Activity	Environmental or Social Risk or benefit	Requirement	Resources / Responsibilities	Timetable	Target / Evaluation Criteria
2.4.	As a part of EHS management system, develop and implement a Hazardous Materials Management Plan (covering a sodium cyanide) Sign cyanide supply contracts with suppliers certified by the International Cyanide Management Institute	Prevention and minimization of pollution to the environment and OHS risks	EBRD PR 3 / IFC PS 3 Legislation of Kazakhstan	JSC ShalkiyaZinc LTD's resources	During mine operation recovery and then at the stage of construction and operation activities	Programme developed and operationalized
2.5.	Develop and implement a comprehensive Emergency Preparedness and Response Programme (that will <i>inter alia</i> address potential failures of the tailings storage facility or the mine water dam, the possible consequences of a significant seismic event)	Various EHS risks, as well as structural risks for the Mine facilities	EBRD PR4 / IFC PS4	JSC ShalkiyaZinc LTD's resources	2016-2017 and implement onwards	Emergency Preparedness and Response Programme developed
2.6.	Develop a Greenhouse Gas Management Plan	The Project implementation could result in increased Greenhouse Gas emissions against low carbon sinking capacity of the Project Area	Legislation of Kazakhstan; EBRD PR3 / IFC PS3; (good practice)	JSC ShalkiyaZinc LTD's resources	2016-2017	Greenhouse Gas Management Plan developed
2.7.	With the commissioning of the facilities being sources of greenhouse gases (GHGs), to timely include their performance indicators into the Mine general report on GHG emissions	Accounting and control of GHG emissions, development of a program to reduce them	EBRD PR3 / IFC PS3; Legislation of Kazakhstan	JSC ShalkiyaZinc LTD's resources	During operation recovery and then throughout construction and operation phases	Annual reports on GHG emissions, including accounting of all GHG sources
2.8.	Install a portable weather measurement device at the site to locally measure wind direction and speed, temperature, precipitation, humidity, solar insolation etc.	Reliable data is required that can be used in air dispersion modelling to produce results that adequately	EBRD PR 1 / IFC PS1;  Good industrial practice	JSC ShalkiyaZinc LTD's resources (low cost device)	Q1 2017	Portable weather station purchased and installed. A suite of representative weather observation data



	Activity	Environmental or Social Risk or benefit	Requirement	Resources / Responsibilities	Timetable	Target / Evaluation Criteria
		reflect pollutant dispersion processes and to respond to the threat of inclement weather.				generated
2.9.	<p>Monitor ambient air quality for particulate matter PM<sub>10</sub> and PM<sub>2.5</sub>, nitrogen, sulphur and carbon oxides (all-day long measurements conducted quarterly) to determine the baseline air conditions.</p> <p>Ensure that the ambient concentrations of zinc and lead in dust (particulate matter) are measured at the mine site and baseline site (Shalkiya North village and Kuttykozha) to measure background concentrations of metals in dust moving from the mine site.</p>	Reliable baseline data is needed (given other existing sources of dust in the area); monitoring can then be continued during the construction and operation	EBRD PR 3/ IFC PS 3; Legislation of Kazakhstan	JSC ShalkiyaZinc LTD's resources	Prior to construction	Measurement protocols and the report on the background concentrations of the air pollutants at the Sanitary Protection Zone's (SPZ) boundary. Protocols on the background ambient concentrations of lead and zinc in dust (particulate matter)
2.10.	<p>Conduct the measurement of noise, vibration and electromagnetic radiation (EMR) levels in the mine's industrial sites and within the SPZ during the intensive work period (with the running above and below ground mechanisms, vehicles, machinery, blasting in nearby quarries of building materials)</p> <p>Conduct the workplace certification at the Mine for a suite of physical impact and workplace air pollution factors.</p> <p>To ascertain the silicosis hazard exposure levels associated with the workplace air pollution in the underground mining areas at the Shalkiya Mine, the</p>	The risks of exposure to noise, vibration, and EMR among the staff and the surrounding animal world	EBRD PR 2 and PR 4; IFC PS 2 and PS 4; Legislation of Kazakhstan	JSC ShalkiyaZinc LTD's resources	2017 onwards	Measurement protocols and the report on the background levels of the physical impact indicators





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	Industrial Monitoring Programme to include measuring the shift-average dust concentrations in the underground working areas and free silica levels in the workplace air in the underground and surface working areas					
2.11.	In the detailed Project design envision noise reduction measures, including: <ul style="list-style-type: none"> <li>• Implementation of enclosure and cladding of processing plants;</li> <li>• Installation of proper sound barriers and / or noise containments, with enclosures and curtains at or near the source equipment (e.g. crushers, grinders, and screens)</li> </ul>	The risks of exposure to noise	EBRD PR 4; IFC PS 4; Legislation of Kazakhstan	JSC ShalkiyaZinc LTD's resources	During design	Relevant design requirements and solutions
2.12.	Develop and implement a Sustainable Water Supply Management Plan to minimize impact of the Project implementation to natural water systems	Reduction of risks of negative impact on groundwater, efficient water use	EBRD PR3 / IFC PS3; IFC EHS Guidelines for Mining RK Legislation	JSC ShalkiyaZinc LTD's resources	2016-2017 and implement onwards	Approved Water Supply Management Plan



	Activity	Environmental or Social Risk or benefit	Requirement	Resources / Responsibilities	Timetable	Target / Evaluation Criteria
2.13.	<p>Establish and maintain a water management balance (including probable climatic events) for the mine and the processing plant circuit featuring closed-loop water supply and reduced makeup water use and use this to inform infrastructure design.</p> <p>Justify the need to use the estimated average mine water inflow in water management predictions at all stages of the Project implementation and PP operation</p>	<p>Efficient water use, including reuse, recycling and treatment of waste water of the processing plant, as well as discharged mine water.</p> <p>Minimization of use of fresh makeup feed water</p>	<p>IFC PS1 &amp; PS3 / EBRD PR1 &amp; PR3; IFC EHS Guidelines for Mining Legislation of Kazakhstan</p>	<p>JSC ShalkiyaZinc LTD's resources</p>	<p>2016-2017</p>	<p>Harmonized water balance taking into account minimized fresh makeup water use</p>
2.14.	<p>Recover the network of observation wells and monitoring of groundwater levels (27 wells), and implement the specialized environmental and hydrogeological studies to estimate the size of the depression cone and aquifer depletion, including the Kuttykhozha water intake. Develop a continuously running computer-based 3-D hydrogeological model to simulate the groundwater seepage processes at the Shalkiya deposit and ensure contemporary forecast assessment of the state of hydrodynamic depression cone and aquifer depletion</p>	<p>Uncontrolled increase in hydrodynamic depression cone and aquifer depletion may affects the Kuttykhozha drinking water intake</p>	<p>EBRD PR 1 &amp; PR3 / IFC PS1 &amp; PS 3; Legislation of Kazakhstan</p>	<p>JSC ShalkiyaZinc LTD's resources</p>	<p>2H 2017 - for the network of observation wells; for other activities - during mine operation recovery and then at the stage of construction and operation activities</p>	<p>Network of observation wells and monitoring of groundwater levels in place.</p> <p>Results of monitoring and Report on assessment of the size of depression cone and aquifer depletion, including the Kuttykhozha water intake.</p>
2.15.	<p>Provide the analysis of microelements (arsenic, cadmium, mercury, lead, copper) in modern well-equipped laboratories for accurate measurements of microelement composition.</p>	<p>Increasing validity of the laboratory analysis, as well as forecasts of toxic metal leaching from ore and rocks and possible contamination</p>	<p>EBRD TR3; IFC PR3 General EHS IFC guidelines for minings, 2007.</p>	<p>Ресурсы АО «ШалкияЦинк ЛТД</p>	<p>2016-2017</p>	<p>Approval of environmental monitoring program</p> <p>Contracting of analytical laboratories with proper equipment and QMS</p>



	Activity	Environmental or Social Risk or benefit	Requirement	Resources / Responsibilities	Timetable	Target / Evaluation Criteria
		of underground water	RK legislation			
2.16.	<p>Include provision for constructing water diversion drains and their design at the following sites: waste rock dumps, mine water pond and treated domestic wastewater storage pond to divert natural surface runoff during winter thaws, spring flash floods and heavy rainfalls</p> <p>Collect and use precipitation flows to provide water for industrial purposes at the Mine site</p>	Risks of flooding and damage to mine facilities during winter thaws and spring floods	EBRD PR3 / IFC PS3; IFC EHS Guidelines for Mining Legislation of Kazakhstan	JSC ShalkiyaZinc LTD's resources	Project facilities' design stage 2016-2017	Design project document and construction of drains to divert snowmelt water, as well as a snowmelt flow collection reservoir
2.17.	<p>When designing ore storage areas, envisage the construction of waterproofing bases with natural (clay layer) coating to prevent leakage of contaminated drainage water.</p> <p>Also, design a network of background and observation wells for ore storage facilities to control possible leaks and groundwater contamination</p>	Risk of groundwater contamination	EBRD PR3 / IFC PS 3 Legislation of Kazakhstan	JSC ShalkiyaZinc LTD's resources	During design and further control at the operation stage	<p>Design and construction of tailings pond and ore storage areas with waterproofing base.</p> <p>Design and construction of the network of background and observation wells to control groundwater contamination</p>
2.18.	<p>Conduct rapid geochemical tests during the exploration and/or mining operations at new mine working sections to classify ores and rocks as PAG or NAG</p> <p>If the rapid test results are unfavourable, ensure that the long-duration kinetic tests</p>	Pollution prevention	EBRD PR3/ IFC PS3; IFC EHS Guidelines for Mining	JSC ShalkiyaZinc LTD's resources	Design stage and then on an on-going basis during operation before development of new sections	Reports on the rapid geochemical tests. Ores present in new mine workings are timely classified as PAG or NAG <sup>1</sup>

<sup>1</sup> PAG and NAG ores are potentially acid generating and non-acid generating ores, respectively



	Activity	Environmental or Social Risk or benefit	Requirement	Resources / Responsibilities	Timetable	Target / Evaluation Criteria
	are conducted to determine the ARD ML potential of ores and rocks present in these new sections					
2.19.	Undertake a radiation safety survey using a specialized organization accredited to conduct this type of survey and produce survey protocols	Health and safety risks	EBRD PR2 / IFC PS2	JSC ShalkiyaZinc LTD's resources	Design stage	Survey report including a description of sampling locations with geographic coordinates and schematic maps
2.20.	Conduct a one-time initial survey of working areas known to have the highest potential natural radiation exposure levels	Health and safety risks	EBRD PR2 / IFC PS2	JSC ShalkiyaZinc LTD's resources	Design stage	Survey report
2.21.	<p>Include in the 2015-2017 'Industrial Environmental Monitoring Programme'<sup>2</sup></p> <ul style="list-style-type: none"> <li>• an action to determine the level of accumulation of alpha-active gas (radon and thoron) and radionuclide content of dust in the workspace air,</li> <li>• an action to measure specific activity levels of naturally occurring radionuclides in ore and rock stripped in the process of current mining operations</li> </ul>	Health and safety risks	EBRD PR2 / IFC PS2	JSC ShalkiyaZinc LTD's resources	2016 and then monitor annually	<p>Monitoring report and protocols</p> <p>Radiation control and safety measures prepared in accordance with the RK regulations</p>
2.22.	Envision scaring devices for birds for their spring and autumn mass migration when designing the tailings storage facility. The Environmental Protection Plan shall also envisage patrolling of the area of the mine water pond during spring and	Risks of deaths of birds during their spring and autumn mass migration on the technical water bodies due to poisoning (tailings pond) or	EBRD PR 6 / IFC PS6; IFC EHS Guidelines for Mining	JSC ShalkiyaZinc LTD's resources	During design and further control at the operation stage	Inclusion of the scaring devices for migratory and summering birds into the project of construction of the processing plant.

<sup>2</sup> This is an on-site environmental monitoring programme developed according to the national regulations and agreed with the relevant competent authorities.



	Activity	Environmental or Social Risk or benefit	Requirement	Resources / Responsibilities	Timetable	Target / Evaluation Criteria
	autumn mass migration to prevent poaching. Raise awareness of mine staff and local residents about a bird hunting ban covering the mine water pond which is a water management facility enjoying a permanent security regime. Install warning signs and signage informing that bird hunting is banned in this area.	poaching (mine water pond)				Installed signage informing that bird hunting is banned in this area.
2.23.	Conduct detailed pre-construction surveys of flora and fauna across the area that will be directly affected by the tailings dam and rock dumps to identify and potentially remove any conservation worthy species of especially flora (endemic and rare species)	Loss of native flora and fauna habitats	EBRD PR6 / IFC PS 6	JSC ShalkiyaZinc LTD's resources	Prior to construction	Flora and fauna survey results
2.24.	Identify (based on the survey results) vulnerable areas and plant habitats in the Project area and, if required (in the event if any endemic plant communities occupying small patches are identified), establish buffer areas or implement reintroduction measures	Loss of native flora and fauna habitats	EBRD PR6 / IFC PS 6	JSC ShalkiyaZinc LTD's resources	Prior to construction	Report on the identified vulnerable areas and plant habitats and further recommendations/ action plan (if needed)
2.25.	Avoid or minimize the creation of physical barriers (trenches, structures and roads) to wildlife movement and migration, including migratory birds	Loss of native flora and fauna habitats	EBRD PR6 / IFC PS 6	JSC ShalkiyaZinc LTD's resources	During design	Appropriate design decisions
2.26.	Develop and implement Disease Preventative Action Plan to address unfavourable epizootic forecasts and emergency response procedures for snake and insect bites (this to cover Action 3.9. Health Awareness Raising	Health and safety risks as the area around the mine is inhabited by animals that serve as carriers for plague causing bacteria such	EBRD PR4/ IFC PS4	JSC ShalkiyaZinc LTD's resources	2016-2017 and implement onwards	Disease Preventative Action Plan developed and operationalized



	Activity	Environmental or Social Risk or benefit	Requirement	Resources / Responsibilities	Timetable	Target / Evaluation Criteria
	Action Plan)	as <i>leishmaniasis</i> , black fever, plaque and so forth.				
2.27.	When setting the location for the planned production facilities, exclude agricultural production (grazing, cultivation of food crops, etc.) in the SPZ of the facilities.	Risk of a dangerous impact of mine facilities on the quality of agricultural products.	EBRD PR3 / IFC PS3; Legislation of Kazakhstan	JSC ShalkiyaZinc LTD's resources Akimats of Zhanakorgan District and Shalkiya settlement	2016-2017	Absence of agricultural production activities within the SPZ, mining and land allotments
2.28.	Support the relocation of the crushed stone production enterprises from the territory of deposit mining and land allotment. During the transition period, work together with the district authorities and Kyzylorda Oblast Natural Resource Use Management Dept to encourage the stone crushing plants to adopt and strictly stick to dust control practices.	Air pollution within the land and mining allotments due to violation of the environmental requirements of the crushed stone production enterprises	EBRD PR3 / IFC PS3; Legislation of Kazakhstan	JSC ShalkiyaZinc LTD's resources Akimats of Zhanakorgan District and Shalkiya settlement	2017	Absence of the crushed stone production enterprises within the mining and land allotments. Reduced dust emissions from stone crushing operations and reduced number of public complaints regarding dust-related nuisance
2.29.	Install seasonal hydrological gauging stations in the Shalkiyasai and Kelte streams to conduct the hydrological monitoring of these surface watercourses	Flooding risks during winter thaws and spring floods can be assessed at the mine site including waste rock dumps, mine water and domestic effluent ponds, and tailings storage facility.	EBRD PR1/ IFC PS1; IFC EHS Guidelines for Mining	JSC ShalkiyaZinc LTD's resources	1H 2017	Results of analyses and a report on hydrological characteristics of the Shalkiyasai and Kelte streams.
2.30.	Assess the actual capacity of the mine water pond	The actual volume of mine water pond is not known and needs to be	IFC PS1 / EBRD PR1;	JSC ShalkiyaZinc LTD's resources	During the Project facilities' design period -	Data on the actual capacity of the mine water dam



	Activity	Environmental or Social Risk or benefit	Requirement	Resources / Responsibilities	Timetable	Target / Evaluation Criteria
		known to confirm the capacity available to meet the processing plant's demand and pond's capacity for the additional pumped groundwater, as well as to assess the risks of flooding during the spring floods.	IFC EHS Guidelines for Mining		2016	
2.31.	Determine the human health and environmental contamination risks related to the composition of the sediment samples from the mine water pond	The composition of bottom sediments and accumulation of toxic compounds in the mine water pond is not known with associated potential health hazards for personnel and local residents due to, inter alia, wind transport of particulate ore material from the exposed beach section of the pond	EBRD PR1 / IFC PS1; IFC EHS Guidelines for Mining	JSC ShalkiyaZinc LTD's resources	2016	The report on the state of the mine water pond's bottom sediments, including the volume and composition of the sediments in the bottom part of the mine water pond and its beach section
2.32.	Determine the content of toxic elements in the fish inhabiting the mine water pond.  If necessary, impose restrictions or ban on amateur fishing activities at the mine water pond	The risk of a negative impact on the local public health via eating fish caught in the mine water pond	EBRD PR1 and PR4; IFC PS1 and PS4	JSC ShalkiyaZinc LTD's resources	2016	The report containing the characteristics of the content of toxic elements in the fish of the mine water pond
2.33.	Waste rock dump design to include the following provisions: – interception drains for diverting flood	Risks of surface water, groundwater and soil contamination from the	EBRD PR1 / IFC PS1; IFC EHS	JSC ShalkiyaZinc LTD's resources	2016-2017	Waste rock dump design and development document that meets





	Activity	Environmental or Social Risk or benefit	Requirement	Resources / Responsibilities	Timetable	Target / Evaluation Criteria
	and storm runoff; – contaminated drainage (toxic metals, radionuclides) collection and diversion system – pragmatic dust control on waste rock dump slopes – assess the option of disposing of overburden in the mine voids	waste rock dump	Guidelines for Mining Legislation of Kazakhstan			environmental requirements prepared
2.34.	Tailings storage facility design and construction to include the following provisions: – bottom lining system; – required level of geotechnical (dynamic and static) stability of the TSF dam throughout its lifecycle and after the TSF closure and decommissioning; – drains for diverting flood and storm runoff; – contaminated drainage (toxic metals, radionuclides) collection and diversion system – pragmatic dust control	Risks of surface water, groundwater and soil contamination from the tailings facility, and dam degradation risk	EBRD PR1 / IFC PS1; IFC EHS Guidelines for Mining Legislation of Kazakhstan	JSC ShalkiyaZinc LTD's resources	2017	Design document for the tailings storage facility that meets environmental requirements for geotechnical stability of the TSF dam throughout its lifecycle including the mine closure phase
2.35.	Design and construct the biological treatment facility for sanitary sewage to prevent the water and soil contamination and to treat water for its technical reuse the processing plant	Risks of groundwater and soil contamination by domestic effluents. Reuse of treated domestic effluents	EBRD PR3 / IFC PS3; IFC EHS Guidelines for Mining RK Legislation	JSC ShalkiyaZinc LTD's resources	2016	Sanitary sewage treatment facility design document that meets environmental requirements
2.36.	Carry out the repair works or construct a new accumulation pond for the treated sanitary water considering environmental protection requirements: - arrangement of the waterproof layer at	Risks of groundwater and vegetation cover contamination, as well as of impact on the community and staff	EBRD PR & IFC PS1; IFC EHS Guidelines for Mining	JSC ShalkiyaZinc LTD's resources	2017	The repair works project document Or The design document for the new accumulation





## SHALKIYA MINE EXPANSION PROJECT (KAZAKHSTAN): ESAP

	Activity	Environmental or Social Risk or benefit	Requirement	Resources / Responsibilities	Timetable	Target / Evaluation Criteria
	the bottom of the pond; - Drainage channels to drain flood and storm water from the pond	health	Legislation of Kazakhstan			pond for the treated sanitary water as per environmental protection requirements
2.37.	Apply the RK Construction Standard "Construction in the Seismic Areas" (SNiP RK 2.03-30-2006) during the design and construction of industrial facilities.	The Project site lies in the area prone to earthquakes of magnitude 7	EBRD PR4 / IFC PS4; Legislation of Kazakhstan	JSC ShalkiyaZinc LTD's resources	Design stage	Compliance with the RK Construction Standard "Construction in the Seismic Areas" (SNiP RK 2.03-30-2006) incorporated in the design
2.38.	Design all structures so that they remain stable after mine closure	Public safety risks as a result of deterioration or physical failure	EBRD PR4 / IFC PS4; RK Legislation	JSC ShalkiyaZinc LTD's resources	Design stage	Appropriate design solutions
2.39.	Update the 2015-2017 Industrial and Environmental Monitoring Programme (IEMP) to take account of indicators recommended in the ESIA (Environmental Monitoring Programme)	A full suite of environmental monitoring data is required to support the design, construction and operations of the Project facilities.	EBRD PRs 1-6 / IFC PSs 1-6; legislation of Kazakhstan	JSC ShalkiyaZinc LTD's resources	2016	Updated IEMP
2.40.	Establish the protection zone around the identified cultural and historical heritage sites (and those that will be identified), alongside the appropriate fencing and signage, or include other protective measures in design documents in regards to identified cultural and historical heritage sites	The risk that the cultural heritage sites can be destroyed	EBRD PR7 / IFC PS7; Legislation of Kazakhstan	JSC ShalkiyaZinc LTD's resources	2016 and for other sites if/when such are found	Report on action taken
2.41.	Prior to the start of construction activity at the Yuzhny shaft construction site, shift the planned facility outside the buffer zone established around the	The risk that a cultural heritage site can be destroyed	EBRD PR7 / IFC PS7; Legislation of	JSC ShalkiyaZinc LTD's resources (executed)	Q2 2016	Report on action taken



	Activity	Environmental or Social Risk or benefit	Requirement	Resources / Responsibilities	Timetable	Target / Evaluation Criteria
	archaeological site or conduct archaeological excavations		Kazakhstan			
2.42.	Conduct detailed investigations at all planned mine infrastructure (transport etc.); conduct the screening survey across the entire area of planned land allotment for zoning purposes and identify potential areas where historical and cultural resources might be present	The risk of destruction of cultural heritage objects	EBRD PR7 / IFC PS 7; Legislation of the RK	JSC ShalkiyaZinc LTD's resources Costs TBD with a specialised archaeological organisation	Q2-3 2016	Report on archaeological survey and a Chance Find Procedure developed
2.43.	Introduce the chance find procedure as required under the RK legislation and described in the Cultural Heritage Management Plan	The risk that cultural heritage sites can be destroyed	EBRD PR7 / IFC PS7	JSC ShalkiyaZinc LTD's resources Costs	Q3 2016	Cultural Heritage Conservation Plan aligned with the IFI requirements
2.44.	Determine social infrastructure development demands of Shalkiya settlement (including housing) correlated with the realistic Project pressure at the full mining capacity operation stage. and taking into account the fate of this infrastructure after the closure of the mine	Risk of creating the settlement that will die after the mine is closed	EBRD PR1/ IFC PS1	JSC ShalkiyaZinc LTD's resources	2016-2017	Report on social infrastructure needs and development plan
2.45.	Initiate community dialogue focused on the creating vision on Shalkiya settlement for the 2030-2050 future perspectives	Social risks posed by the job creation and associated spending that will occur during the mine life and then cease at the end of mine operations	EBRD PR 1& PR 10 / IFC PS 1	JSC ShalkiyaZinc LTD together with the Shalkiya Akimat	2016	Dialogue (ongoing) – plans and protocols of meetings; Vision for the period of 2030-2050 created



	Activity	Environmental or Social Risk or benefit	Requirement	Resources / Responsibilities	Timetable	Target / Evaluation Criteria
2.46.	Implement Stakeholder Engagement Plan (SEP), analyze the results and update it for the construction stage	Effective stakeholder engagement is a requirement of all lenders.	EBRD PR 1 / IFC PS1	JSC ShalkiyaZinc LTD's resources	2016-2017	Updated SEP
2.47.	For improving the visual and aesthetic appearance of the industrial site, engage a specialised organisation to develop and implement the site landscaping and greening project using fast-growing aboriginal plant species that are not water demanding	Increased intensity of wind erosion	EBRD PR3, IFC PS3	JSC ShalkiyaZinc LTD with the involvement of specialized companies	Design / site preparation and mine restoration stage	Project completed and greenery planted
<b>3. Construction Stage</b>						
3.1.	Carefully store topsoil material. Exposed soils and other erodible materials (such as banks of the TSF, slopes of waste rock stockpiles) should be revegetated or covered promptly using a clay lining.  New areas of topsoil cover should be cleared and opened-up only when absolutely necessary	Loss of soil which is a valuable resource considering the thinness and low fertility of soil layer	EBRD PR3 & PR6 / IFC PS3 & IFC PS6 Legislation of Kazakhstan	JSC ShalkiyaZinc LTD's resources	As the mine construction proceeds	Topsoil stripped and stored for future reuse in site landscaping and restoration activities
3.2.	Minimise the unauthorized development of roads in the adjacent areas and ban heavy haul trucks from unpaved roads and those not designated as haul routes	Deformation of natural landscape and topography; degradation of topsoil layer	EBRD PR3, PR6	JSC ShalkiyaZinc LTD's resources	Continuously throughout construction	Designated haul routes for temporary access. Visual inspection to make sure that the number of unauthorized roads is reduced
3.3.	All earthworks, as well as temporary storage of building materials and construction waste, should be performed	Persistent (due to the local climate) spatial and linear degradation	EBRD PR3, PR6	JSC ShalkiyaZinc LTD's resources	Continuously throughout construction	Temporary structures located in a manner that meets the design



	Activity	Environmental or Social Risk or benefit	Requirement	Resources / Responsibilities	Timetable	Target / Evaluation Criteria
	strictly in line with the design provisions and within the boundaries of allocated construction sites	of topsoil and vegetation cover				provisions within the construction site and land allotment boundaries
3.4.	<p>Maintain dust suppression measures:</p> <ul style="list-style-type: none"> <li>• water spraying using technical water from mine water pond only for the onsite unpaved roads and temporary access roads for vehicles;</li> <li>• optimization of traffic patterns,</li> <li>• reduction of travel speeds</li> <li>• disturbed land surfaces should be re-vegetated or otherwise rendered non-dust forming when inactive;</li> <li>• Storage for dusty materials should be enclosed or operated with efficient dust suppressing measures;</li> <li>• Loading, transfer, and discharge of materials should take place with a minimum height of fall, and be shielded against the wind;</li> <li>• Transportation of marketable fine zinc and lead concentrates should be carried out in packed form in order to avoid dusting during loading to and unloading from railway cars;</li> <li>• Conveyor systems for dusty materials should be covered and equipped with measures for cleaning return belts</li> </ul>	Dust propagation and deterioration of plant growth conditions	EBRD PR3 / IFC PS3 Legislation of Kazakhstan	JSC ShalkiyaZinc LTD's resources	Continuously throughout construction and operation stages	<p>Availability of specialized watering vehicles, watering schedule.</p> <p>Site inspection reports</p>
3.5.	Conduct geobotanical survey of the industrial sites, SPZ and adjacent areas during the plant growth season (May-June).	There is a risk that the Red Data Book species may be lost	EBRD PR6 / IFC PS6	JSC ShalkiyaZinc LTD with the involvement of specialized	2016-2017	Report on the geobotanical survey of the industrial sites, SPZ and adjacent areas



	<b>Activity</b>	<b>Environmental or Social Risk or benefit</b>	<b>Requirement</b>	<b>Resources / Responsibilities</b>	<b>Timetable</b>	<b>Target / Evaluation Criteria</b>
	If endemic and Red Data Book plant species are found to be present in the Sanitary Protection Zone boundaries, ensure their conservation and – if necessary – reintroduction into similar local habitats (ecotopes) with the support of relevant specialists			companies		during the plant growth season (May-June).
3.6.	Support the Zhanakorgan District Medical and Veterinary Services to prepare annual epizootic forecasts for the project area upon the Company request	Risk of disease among the mine staff	EBRD PR4 / IFC PS4 OHSAS 1800	JSC ShalkiyaZinc LTD with the involvement of the Zhanakorgan District Medical and Veterinary Services	Annually throughout construction. An annual forecast to be prepared in autumn for the next epizootic cycle	Annual epizootic forecasts available
3.7.	Organise sanitary/health awareness raising actions for the mine staff	Risk of epizootic disease outbreaks among the mine staff	EBRD PR4 / IFC PS4 OHSAS 1800 Legislation of Kazakhstan	JSC ShalkiyaZinc LTD with the involvement of the Zhanakorgan District Medical and Veterinary Services	Continuously throughout construction and operation	The Health Awareness Raising Action Plan available. Zero disease incidence among the mine staff
3.8.	To reduce noise optimize mine related traffic routing especially avoiding deliveries at night	Community health and safety	EBRD PR4, IFC PS4	JSC ShalkiyaZinc LTD's resources	Early at the construction stage	Traffic schedule
3.9.	Implement measures to reduce risk of death or injury as a result of road accidents as outlined in the ESIA (Section 9.13.5)	Community health and safety	EBRD PR4, IFC PS4	JSC ShalkiyaZinc LTD's resources	During construction and operation	Relevant measures are implemented
3.10.	The designer should supervise compliance with the RK Construction Standard "Construction in Seismic Areas" (SNiP RK 2.03-30-2006) during the	Risk of structural damage and related negative health consequences	EBRD PR 1/ IFC PS 1	JSC ShalkiyaZinc LTD's resources	Construction stage	Inspection report by the design company



	Activity	Environmental or Social Risk or benefit	Requirement	Resources / Responsibilities	Timetable	Target / Evaluation Criteria
	construction of key Project facilities including housing and accommodation for the Mine staff					
3.11.	Develop and implement professional education programs including career guidance for school children from the adjacent villages	Positive impact of local job creation and carrier perspective should be strengthening	EBRD PR2/ IFC PS2	JSC ShalkiyaZinc LTD's resources	Beginning of the construction stage; implementation – during the project life	Professional education programs developed
3.12.	Implement the updated SEP (for construction stage) and report to the community and the bank.	Community communication risks	EBRD PR10, IFC PS1	JSC ShalkiyaZinc LTD's resources	Construction stage	SEP annual analysis and report
3.13.	Develop the Community Development Plan. As a part of the plan, consider the facilitation of local initiatives aimed local business diversification	Risk of the community demolishing after the Mine closure	EBRD PR 10/ IFC PS 1	JSC ShalkiyaZinc LTD's resources	Construction stage	Community Development Plan developed
3.14.	Implement Actions 1.1-1.5, 2.1, 2.3, 2.4, 2.5, 2.7, 2.10, 2.12, 2.14, 2.20, 2.25, and 2.39 during the construction stage					
<b>4. Operation Phase</b>						
4.1.	Organise systematic monitoring and regular review of data on geotechnical stability of dams retaining the mine water storage pond, tailings storage facility, and treated domestic wastewater storage pond	Risk of dam failure, flooding and contamination spreading down the slope, and groundwater contamination	EBRD PR1 & PR3 / IFC PS1 & PS3 IFC EHS Guidelines for Mining RK Legislation	JSC ShalkiyaZinc LTD's resources	Regularly during operation	Geotechnical Stability Monitoring Programme for dams retaining the mine water storage pond, tailings storage facility, and treated domestic wastewater storage pond, reports on monitoring and dam maintenance activities
4.2.	Maintain dust suppression measures at the previous stages	Deteriorated air quality. Dusty soil cover and	EBRD PR3 / IFC PS3	JSC ShalkiyaZinc LTD's resources	Continuously throughout	Availability of specialized watering vehicles,



	Activity	Environmental or Social Risk or benefit	Requirement	Resources / Responsibilities	Timetable	Target / Evaluation Criteria
		reduced conditions for vegetation growth	Legislation of Kazakhstan		operation	watering schedule.
4.3.	As a compensation measure, support the development of the regional ecological network initiated by regional specialised organisations	There is a risk that key habitats may be lost and regional ecological balance upset	EBRD PR6/ IFC PS6	JSC ShalkiyaZinc LTD with the involvement of specialized companies	As deemed necessary	Initiatives proposed by specialized authorities at the district or region level
4.4.	Prevent littering and illegal waste disposal (including construction waste) after the demolition and dismantling of structures that are no longer needed	Loss of natural landscapes	EBRD PR3 / IFC PS3	JSC ShalkiyaZinc LTD's resources	As the mine construction proceeds	Clean industrial site and adjacent areas
4.5.	Implement, evaluate and update the SEP and the local Community Development Plan including the support of local business diversification	Risks of opposition to the project and communication dissatisfaction	EBRD PR 10. IFC PS1	JSC ShalkiyaZinc LTD's resources	Operational stage	Monitor the implementation of the SEP and Community Development Plan
4.6.	Implement Actions 1.1-1.5, 2.1, 2.3, 2.4, 2.5, 2.7, 2.10, 2.12, 2.14, 2.16, 2.17, 2.20, 2.21, 2.25, 2.39, 3.4, 3.7, 3.9, and 3.11 at the operation stage					
<b>5. Mine Closure / Aftercare Phase</b>						
5.1.	Based on the Preliminary Closure and Reclamation Plan and information gathered during the mine construction and operation, develop and implement a detailed mine Closure and Reclamation Plan	Dust propagation and deterioration of plant growth conditions Ensure public safety in the closed/sealed mine working areas	EBRD PR3 IFC PS3 Legislation of Kazakhstan	JSC ShalkiyaZinc LTD's resources	After the completion of mining operations	Detailed Closure and Reclamation Plan developed with budgets, duties and timelines

