



## APPENDIX B

### Framework Biodiversity Action Plan

Item	Phase	Measure/Activity	Relevant Standard	Resources	Timeline and frequency	Compliance Indicator	Status
AD	Additional Studies						
AD01	Pre-construction	<p><b>Common tortoise (<i>Testudo graeca</i>) Transect Survey</b></p> <p>Sampling transects of approximately 300-500 m will be performed within the LSA. The transects will be located in different habitat types potentially suitable for hosting the target species according to literature. Surveys should be performed during tortoise activity periods, in spring during the central part of the day (between 10:00 h and 14:00 h) or in the summer season during the morning or afternoon (between 09:00 h and 10:00 h and between 16:00h and 18:00 h). Surveyors should record all living tortoises, carcasses, scats, verified burrows (with scats or tortoises inside), and otherwise suitable/potential burrows. A minimum of 10 sampling points will be visited</p>	PR6 par. 7-8	External wildlife expert	Once during tortoise activity period (spring/summer)	Additional Study Report	Ongoing
AD02	Pre-construction	<p><b>Turtledove (<i>Streptopelia turtur</i>) Point count Survey</b></p> <p>This survey will comprise a series of watches from a fixed location for observation and listening of bird species. Each Point count Survey will have a duration of about 20-30 minutes. Sampling stations will be located in different habitat types potentially suitable for hosting the target species according to literature. A minimum of 10 bird surveys will be carried out in the period from May to August. The location of each sampling stations will be recorded with a GPS.</p>	PR6 par. 7-8	External wildlife expert	Once during Turtledove nesting season (May to August)	Additional Study Report	Ongoing



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AD03	Pre-construction	<p><b>Imperial Eagle (<i>Aquila heliaca</i>) Vantage Point Survey</b></p> <p>This survey will comprise a series of watches from a fixed location for observation and listening of bird species. Each Vantage Point Surveys will have a duration of about 20-30 minutes. Sampling stations will be located in different habitat types potentially suitable for hosting the target species according to literature. A minimum of 10 bird surveys will be carried out in the period from May to August at the beginning of the construction activities. The location of each sampling stations will be recorded with a GPS</p>	PR6 par. 7-8	External wildlife expert	Once during imperial eagle nesting season (May to August)	Additional Study Report	Ongoing
AD04	Pre-construction	<p><b>Endemic and vulnerable flora species survey</b></p> <p>A minimum of 25 sampling stations will be carried out in the LSA during each species flowering period. The exact final location of each sampling stations will be recorded with a GPS using a unique sampling station code to identify it.</p> <p>The position of the sampling stations will be stratified based on the results of the preliminary habitat suitability models elaborated for all the endemic flora species and in particular on the species determining PBF (<i>Cyclamen hederifolium</i>). Sampling stations will selected in areas with high to medium suitability for the presence of the flora species.</p>	PR6 par. 7-8-15	External vegetation expert	<p>Once during the species flowering season:</p> <p>second half of March for <i>Crocus biflorus</i> subsp. <i>nubigena</i>;</p> <p>end of May/ beginning of June <i>Campanula lyrata</i> subsp. <i>lyrata</i> and <i>Verbascum parviflorum</i>;</p>	Additional Study Report	Ongoing



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		<p>At each sampling station, a meander search pattern within the selected habitat will be used for the survey targeting micro-habitats and eco-tones suitable for the presence of the flora species. Each meander search will continue for 20-30 minutes in the vicinity of the survey point selected.</p> <p>At each sampling station a survey will be completed whether the target flora species are identified or no, For each sampling stations the following data will be collected as a minimum:</p> <ul style="list-style-type: none"> <li>• unique sampling stations code;</li> <li>• surveyors name;</li> <li>• survey date;</li> <li>• GPS coordinate (DATUM: ED1950 - UTMZone 35N);</li> <li>• reference number of photos taken;</li> <li>• slope (decimal degree),</li> <li>• aspect(N–E–S–W);</li> <li>• EUNIS habitat type and brief description;</li> <li>• main vascular flora species present and their cover class (Braun-Blanquet cover-abundance scale);</li> <li>• main threat/disturbance present (e.g. grazing, soil erosion, dust deposition) and disturbance level (high, medium, low);</li> </ul>			<p>end of June/beginning of July <i>Minuartia juressi</i>;</p> <p>first half of November for <i>Cyclamen hederifolium</i>.</p>		



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		<ul style="list-style-type: none"> <li>any other information considered useful (e.g. any particular fauna activities, signs of recent flooding, possible future disturbance).</li> </ul> <p>If target flora species are observed the exact location of the populations will be mapped using a GPS and their extension (m<sup>2</sup>), abundance (number of individuals) and percentage (%) of flowering/ fruiting/ seeding individuals will be estimated.</p> <p>Photographic documentation will be collected at each sampling point. Photos will be taken in all cardinal directions (N–E–S–W) to represent the habitat type, eventual disturbances and any other particular considered useful. The photos will be collected in folders separate for each sampling stations and identify with the unique sampling stations code</p>					
AD05	Construction	<b>Decommissioning and Closure Plan</b> <p>A Decommissioning and Closure Plan will be presented to address the rehabilitation and reclamation of all project facilities, including associate facilities. Clear rehabilitation targets, timelines and monitoring measures will to be included in the plan.</p>	PR6 par. 8-11	TUMAD internal resources with the support of external biodiversity expert	Expected completion in June 2018	Final Decommissioning and Closure Plan	Not started
<b>MM</b>	<b>Mitigation Measures</b>						
MM01	Pre-construction	<b>Avoidance:</b>	PR6 par. 11-13-16	TUMAD internal resources	During final project design	Final design	Ongoing



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		minimising the footprint of individual facilities					
MM02	Pre-construction	<b>Avoidance:</b> minimising the length of internal and access roads;	PR6 par. 11-13-16	TUMAD internal resources	During final project design	Final design	Ongoing
MM03	Pre-construction	<b>Avoidance:</b> on-site conservation of endemic and vulnerable flora species will be provided by setting aside specific fenced areas where soil and vegetation will be preserved and access will not be permitted. The identification and delimitation of this areas will be performed during the flowering period of the species	PR6 par. 11-13-16	External vegetation expert	Prior to construction	Creation of on-site conservation areas – Annual Biodiversity report	Ongoing
MM04	Per-Construction	<b>Minimization (habitat loss and habitat fragmentation):</b> individuals of <i>Cyclamen hederifolium</i> determining PBF directly impacted by the project will be identified and salvaged. The salvaged individuals will be temporary grown in a greenhouse and used for multiplication in order to create a pool of individuals to be used for future offset measures. Considering that the best time to identify the species is during their flowering periods (between the end of June and the beginning of July), site preparation activities will be postponed to allow for the salvaging of the individuals directly impacted	PR6 par. 11-13-16	External vegetation expert	Prior to construction	Record of salvaged individuals – Annual Biodiversity report	Not started
MM05	Construction	<b>Minimization (increased mortality for wildlife due to site preparation and vehicular traffic):</b> An ecologist appointed by the Construction Contractor will perform pre-construction surveys in the areas prior to vegetation clearing. The survey will focus on fauna species and nests.	PR6 par. 11-13-16	External wildlife expert	A few days (not more than a week) before vegetation clearing and site preparation activities	Record of pre construction survey – Annual Biodiversity report	Not started



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		<ul style="list-style-type: none"> <li>If fauna species with limited mobility that cannot move ahead of construction (e.g. Common tortoise) are observed they will be collected by the ecologist and translocated to undisturbed but similar sites within the LSA.</li> <li>If nests are observed, TUMAD will undertake their best efforts to preserve the vegetation in place</li> </ul>					
MM06	Construction	<b>Minimization (habitat loss and habitat fragmentation):</b> construction sites will be fenced or clearly delimited in order to reduce the risk of footprint creep	PR6 par. 11-13-16	TUMAD internal resources	During construction activities	Presence of fence	Not started
MM07	Construction	<b>Minimization (habitat loss and habitat fragmentation):</b> culverts with specific conducive design to be used by reptiles, and in particular tortoises, will be installed under the access road in a sufficient number to minimize the effects of habitat fragmentation	PR6 par. 11-13-16	TUMAD internal resources in consultation with external wildlife expert	During construction activities	Final design – Annual Biodiversity report	Not started
MM08	Construction	<b>Minimization (changes in local morphology and hydrology):</b> culverts will be designed and constructed on the access road in line with temporary river beds or other drainage features in order to minimize the interference with local hydrology	PR6 par. 11-13-16	TUMAD internal resources	During construction activities	Final design – Annual Biodiversity report	Not started
MM09	Construction	<b>Minimization (increased exposure to atmospheric pollutants):</b> in dry periods dirt roads and soil stock piles should be sprayed with water in order to reduce dust	PR6 par. 11-13-16	TUMAD internal resources	During dry periods	Record of training - Annual Biodiversity report	Not started



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MM10	Construction	<b>Minimization (spreading of alien species):</b> if spreading of invasive species is observed, an appropriate eradication program will be developed and implemented	PR6 par. 11-13-16-21	TUMAD internal resources in consultation with external vegetation expert	During construction, if needed	Record of activity - Annual Biodiversity report	Not started
MM11	Construction /Operation	<b>Avoidance:</b> hunting and collection of wild animals, and in particular of <i>Testudo graeca</i> (Common tortoise) by TUMAD staff and contractors will be strictly prohibited within the Project area.	PR6 par. 11-13-16	TUMAD internal resources	During construction and operation	Record of internal regulation - Annual Biodiversity report	Not started
MM12	Construction /Operation	<b>Minimization (increased exposure to atmospheric pollutants):</b> vehicle speed should be reduced on dirt road within and outside the mine site	PR6 par. 11-13-16	TUMAD internal resources	During construction and operation	Record of activity - Annual Biodiversity report	Not started
MM13	Construction /Operation	<b>Minimization (increased mortality for wildlife due to site preparation and vehicular traffic):</b> speed limits and animal crossing signs will be installed and enforced on the access road and on the site roads. If necessary, speed bumps and noise stripes will also be installed on straight sections of the access road	PR6 par. 11-13-16	TUMAD internal resources	During construction and operation	Record action - Annual Biodiversity report	Not started
MM14	Construction /Operation	<b>Minimization (increased mortality for wildlife due to site preparation and vehicular traffic):</b> training will be provided to all staff and contractors on road safety, and wildlife awareness	PR6 par. 11-13-16	External wildlife expert	During construction and operation	Record of training - Annual Biodiversity report	Not started
MM15	Construction /Operation	<b>Minimization (habitat loss and habitat fragmentation):</b> all vehicles will be driven on designated routes unless otherwise authorised	PR6 par. 11-13-16	TUMAD internal resources	During construction and operation	Record of internal regulation - Annual Biodiversity report	Not started



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MM16	Construction /Operation	<p><b>Minimization (habitat loss and habitat fragmentation):</b></p> <p>seeds of all the endemic and vulnerable flora species will be collected follow the best practice indicated by the Millennium Seed Bank. and donated to the Ankara Seed Bank<sup>1</sup>. If needed depending on seed availability, seed collections will be repeated on multiple years within the LSA</p>	PR6 par. 11-13-16	External vegetation expert	<p>At seed maturity and before seed dispersal:</p> <p>late March/ early April <i>Crocus biflorus</i> subsp. <i>nubigena</i>;</p> <p>second half of July for <i>Campanula lyrata</i> subsp. <i>lyrata</i> and <i>Verbascum parviflorum</i>;</p> <p>end of July/beginning of August for <i>Minuartia juressi</i></p> <p>late November/ early December <i>Cyclamen hederifolium</i></p>	Record of activity - Annual Biodiversity report	Not started
MM17	Construction /Operation	<p><b>Minimization (changes in local morphology and hydrology):</b></p>	PR6 par. 11-13-16	TUMAD internal resources	During construction and operation	Record of activity - Annual Biodiversity report	Not started

<sup>1</sup> (<http://www.kew.org/kew-science/people-and-data/resources-and-databases/millennium-seed-bank-resources>).





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		environmental engineering techniques will be applied in order to create stable slope and minimise the risk of erosion					
MM18	Construction /Operation	<b><u>Minimization (behavioural changes due to noise and vibration):</u></b> rock blasting activities will be performed during the day time and at regular times to enhance local fauna habituation to noise and avoid disturbance during critical hours for many species (dusk and dawn)	PR6 par. 11-13-16	TUMAD internal resources	During construction and operation	Record internal regulation-Annual Biodiversity report	Not started
MM19	Construction /Operation	<b><u>Rehabilitation/Restoration:</u></b> topsoil will be separately stored at the site and used for progressive restoration and rehabilitation after the closure of the mine in accordance to regulations and best practice	PR6 par. 11-13-16	TUMAD internal resources	During construction and operation	Record of activity - Annual Biodiversity report	Not started
MM20	Construction /Operation	<b><u>Rehabilitation/Restoration:</u></b> progressive restoration of areas cleared during construction but not subjected to the placement of permanent facilities (e.g. laydown areas, pipeline route; powerline access roads) will occur with the goal of producing a stable vegetative cover to minimize erosion, dust and spreading of invasive alien species	PR6 par. 11-13-16	TUMAD internal resources in consultation with external vegetation expert	During construction and operation	Record of activity - Annual Biodiversity report	Not started
MM21	Construction	<b><u>Minimization (increased mortality for wildlife due to vehicular traffic and presence of powerline):</u></b> in order to minimize the risk of bird collision with the powerline TUMAD will negotiate the installation of line markers every 10-20 m along the entire length of the powerline	PR6 par. 11-13-16	TUMAD internal resources in consultation with external wildlife expert	During Construction	Record of activity - Annual Biodiversity report	Not started
MM22	Construction	<b><u>Minimization (increased mortality for wildlife due to vehicular traffic and presence of powerline):</u></b>	PR6 par. 11-13-16	TUMAD internal resources in consultation with	During Construction	Record of activity - Annual	Not started



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		in order to minimize the risk of bird electrocution with the powerline TUMAD will negotiate the installation of insulation of energised parts, discouragers (spikes) to be placed on top of potential perching sites and artificial bird safe perches and nesting platforms placed at a safe distance from the energised parts (Bayle, 1999 ).		external wildlife expert		Biodiversity report	
MM23	Operation	<b>Minimization (increased exposure to contamination of soil and surface water):</b> an effective and comprehensive Hazardous Material Management Plan will be implemented and constantly updated	PR6 par. 11-13-16	TUMAD internal resources	During operation	Hazardous Material Management Plan	Not started
MM24	Operation	<b>Minimization (increased exposure to contamination of soil and surface water):</b> employee and contractors will report any accidental spills of hazardous substances on a spill register, reporting the spill type, quantity, location, area impacted, and clean-up methods will be created and constantly updated.	PR6 par. 11-13-16	TUMAD internal resources	During operation	Hazardous Material Spill Register	Not started
MO	<b>Monitoring</b>						
MO01	Construction	The development of the construction sites should be monitored weekly in order to avoid footprint creep within and outside the fence line	PR6 par. 7-11-13-16	TUMAD internal resources	Weekly during construction	Record of monitoring - Annual Biodiversity report	Not started
MO02	Construction	On site conservation areas adjacent to active construction sites should be monitored monthly for inadvertent disturbance.	PR6 par. 7-11-13-16	TUMAD internal resources	Monthly during construction	Record of monitoring - Annual Biodiversity report	Not started



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MO03	Construction	Dust accumulation in areas characterized by critical habitats and endemic species on-site and within 100 m from the facilities will be monitored every three months in the vegetative season during construction. If excessive dust accumulation or stress signs are noticed, additional site-specific mitigation measures will be applied (e.g. additional dust management measure, temporary dust screens, water spray to clean plants).	PR6 par. 7-11-13-16	TUMAD internal resources	Every three months in the vegetative season (May to November) season during construction	Record of monitoring - Annual Biodiversity report	Not started
MO04	Construction	The presence and spread of invasive flora species will be monitored every three month during the vegetative season, with particular attention to disturbed and restored areas for at least 3 years after the end of the construction phase	PR6 par. 7-11-13-16	TUMAD internal resources in consultation with external vegetation expert	Every three months in the vegetative season (May to November) season during construction	Record of monitoring - Annual Biodiversity report	Not started
MO05	Construction /Operation	Accidents involving wildlife or observations of living animal or carcasses along the access road will be registered. The results of the monitoring will be reviewed periodically and additional mitigation measure to avoid road kill will be taken if needed (e.g. fences, wildlife passages)	PR6 par. 7-11-13-16	TUMAD internal resources in consultation with external wildlife expert	During Construction and Operation	Record of monitoring - Annual Biodiversity report	Not started
MO06	Construction /Operation	Culverts will be regularly monitored (once every three months) to avoid any blockages or erosion that would made them unsuitable for target wildlife.	PR6 par. 7-11-13-16	TUMAD internal resources	Every three months in the vegetative season during construction and operation	Record of monitoring - Annual Biodiversity report	Not started
MO07	Construction /Operation	Signs of erosions in areas characterize by critical habitats and endemic speices within 100 m from the facilities will be monitored every three months in the vegetative season. If erosion signs are	PR6 par. 7-11-13-16	TUMAD internal resources in consultation with	Every three months in the vegetative	Record of monitoring - Annual	Not started



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		noticed, additional site-specific mitigation measures will be applied (e.g. erosion control mat, additional engineering measures, additional culvert or channels for storm water)		external vegetation expert	season (May to November)	Biodiversity report	
MO08	Construction /Operation	Monitoring of erosion and accumulation of stagnant water on construction sites and areas cleared of vegetation should be performed monthly during the rainy season (October to April). In case of excessive accumulation of stagnant water or erosion phenomena are observed, additional mitigation measures should be put in place as appropriate in an effective and timely manner (e.g. additional culverts on linear infrastructures, deviation channels, environmental engineering techniques for slope stability)	PR6 par. 7-11-13-16	TUMAD internal resources	Monthly during the rainy season (October to April)	Record of monitoring - Annual Biodiversity report	Not started
MO09	Construction /Operation	Areas progressively restored will be inspected monthly for the first year during the vegetative season, after the first year these areas will be inspected every three month at least for the next three years or until the objective of restoration are achieved, in order to allow for prompt corrective actions if required. The monitoring will aim to assess the development of the planted/seeded species, the vegetation cover and the presence of vegetation stress, invasive species or erosion signs	PR6 par. 7-11-13-16	TUMAD internal resources in consultation with external vegetation expert	Monthly for the first year during the vegetative season (May to November) After the first year every three months during the vegetative season (May to November) at least for the next three years or until the objective of restoration are achieved	Record of monitoring - Annual Biodiversity report	Not started



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MO10	Operation	The implementation of the Explosives and Hazardous Materials Management Plan will be monitored and the records on the spill register reviewed. The Hazardous Material Management Plan will be updated regularly as needed.	PR6 par. 7-11-13-16	TUMAD internal resources	During operation	Record of monitoring - Annual Biodiversity report	Not started