

## **Nature Conservation**

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# Balkan Mineral and Mining AD

## **REPORT**

**Assessment on the Compatibility of Conservation Objectives of the Protected Zone Eastern Rhodope and Protected Zone Krumovitza with the Investment Proposal "Extraction and Processing of Gold-Bearing Ore from the Krumovgrad Exploration Area"**



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### **List of abbreviations:**

<b>Abbreviation</b>	<b>Term in full</b>
FCS	Favourable Conservation Status
IP	Investment Proposal
PZ	Protected Zone
CA	Compatibility Assessment



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## 1. Preface

This assessment is made pursuant to art. 6 (3) and art. 6 (4) Directive 92/43/EEC, art. 31-34 of the Bulgarian Law on Biodiversity and the Regulation on the requirements for conducting a compatibility assessment (CA) of plans, programmes, projects and investment proposals and the conservation objectives and goals of protected zones (PZ).

The form and content of the Assessment are consistent with the requirements of MoEW with letter № OBOC- 1402/24.06.2010.

Apart from the procedural requirements, in assessing the likelihood of adverse impacts and their significance the following principles are considered:

- ✦ The precautionary principle enshrined as a basis for environmental protection in the Treaty establishing the EU, and in this case interpreted as the adoption of a worst case scenario for any likely impact within the scientific preconditions for the existence of such effects.
- ✦ Use of the best available information to conduct the assessment.
- ✦ The relationship between arts. 6 (3) Directive 92/43/EEC requiring assessment of the impacts on the integrity and objectives of each individual zone and the network as a whole and art. 2 (2) of the same Directive stipulating that the measures introduced under this Directive should lead to preservation or restoration of the favorable conservation status (FCS) of the types habitats;
- ✦ In accordance with the above, the integrity and the objectives of potential Sites of Community Importance are interpreted in the light of the detailed FCS parameters for natural habitats and species, developed in accordance with definitions of art. 1 of the Directive by the Bulgarian-Dutch project under the programme MATRA BBI. Particularly important elements for the FCS are the population in the zone (species only), the habitat's area in the zone (for natural habitats and species), structure and functions of the habitats. The parameters for "Future Prospects" criterion in most cases can be viewed as impacts.
- ✦ Apart from the general parameters for FCS of each species and habitat, the impacts on structures and functions of importance for particular species and habitat are also assessed.
- ✦ In the impact assessment, with respect to quantitative parameters "Habitat Area" (for both natural habitats or species habitats) and "Species Population" as reference values are taken the values from the scientific description of the respective zone, but only if these values have been determined after the ratification of the Treaty of Accession to the EU (April 2005). In assessing the restoration possibilities, the feasibility of this requirement is assessed. This means that where there has been a permanent destruction of an area of habitat, even if restoration is required pursuant to the FCS parameters, in the absence of realistic restoration options such permanently damaged areas are not included in the reference values for "Habitat Area" and "Species Population". Examples of such cases include areas with built infrastructures and other built-up areas.
- ✦ Regarding the parameters for the quality and status of habitats (parameters within the criteria «Structure and Functions»), reference values of the parameters are also applied to existing facilities/installations. For example, the effects of habitat's fragmentation and destruction in the past by the existing infrastructure are taken into account when assessing cumulative impacts.
- ✦ The received positions about the scope and content of the impact assessment of the investment proposal. In making this Natura 2000 Assessment are taken into account all the manuals and documents of the European Commission concerning Natura 2000, including manual "Natura 2000 and mining industry for non-energy purposes".



## 2. Information on the investment proposal for "Extraction and processing of gold ores from study area "Krumovgrad" and its links to protected zones from the Natura 2000 Network.

### 2.1. Characteristics of the investment proposal

BMM EAD's investment proposal is for the mining and processing of gold ores from the Khan Krum field, Ada Tepe section, Krumovgrad Municipality, Kardzhali Region. The main site, where the investment proposal will be developed is located about 3 km south of the town of Krumovgrad, Kardzhali Region. The main activities planned in the investment proposal (Alternative 1) include:

1. Extraction of gold ores by an open cut method;
2. Processing of ore to concentrate by crushing, grinding and flotation;
3. Storage of mining waste (rock materials and waste from enrichment), soil, ores and low grade ores;

The "Khan Krum" field includes four sections - Ada Tepe, Kaklitsa, Sarnak and Skalak.

Proposal will be developed only in the area of Ada Tepe Khan Krum field in the amount of 0.85 million t/year with expected period of operation 9 years.

The overall foreseen area, which is needed for the realisation of the investment proposal is 85 ha, in which the following objects are included (Annex V):

- Opencast pit (Ada Tepe) – 17 ha;
- Ore dump – 3 ha;
- Installation for gold-silver concentrate production (enrichment plant) – 6 ha;
- Integrated equipment for ore waste storage – 41 ha;
- Landfill for soil materials – 2 ha;
- Circulate waters reservoir (close to the mine) and 2 collector shafts – 4 ha;
- Roads – 12 ha;
- Drilling well.

The expected needed areas for the realization of the proposal belong entirely to forests. These areas are included in the future concession territory. According to transportation plan the route will be over village Tokachka, in other words the IP will not generate heavy traffic in the city of Krumovgrad and river Krumovitsa, which will minimize the probability of accidents that could lead to environmental impact.

The implementation of the IP is planned to begin production in the already defined field Ada Tepe. Along with the implementation of the proposal, exploration activities in neighboring areas of Kaklitsa, Sarnak, Skalak and Kapel will be undertaken. In the event of finding economically viable for mining reserves, they will be conducted in a separate procedure of EIA and Compatibility assessment (Natura 2000) with the object and purpose of protected zone "Eastern Rhodope".

**Alternative 2** expects the ore processing to block of pure metal as final product (i.e. Dore alloy) to be held by the method of cyanide extraction of the gold and silver. Its realization requires as twice as much area (156 ha), construction of a tailings dam and usage of toxic compounds (cyanides). For more detailed description of Alternative 2, refer to EIA Report.

### 2.2. Description of implemented, proposed or approved plans, programmes, projects (PPP) and investment proposals that can have adverse interactive or cumulative impacts in combination with investment proposal (Alternative 1)

By order of the Information Access Act was obtained from the Ministry of Environment and Water and the Regional Inspectorate of Environment and Water in Haskovo information for the following IP within the protected area "Rhodopes – East":

1. Received investment proposals for prospecting of mining and decisions issued for the period of 2007-2010 are in total 48. Of this total area of all land intended for mining (quarries), under decisions of Ministry and RIEW Haskovo is 4035,91 ha. This is 1,85 % of the total protected area Eastern Rhodopes, which is significant share of the territory influenced or will be influenced in the future. Their total cumulative impact on site level could be significant if they affect species and habitats which are conservation object in the zone. Decisions for mining activities are issued for



territory of 20982,54 ha. Just few of these territories have prospects for mining. Natura 2000 Assessment of the IP with the object and purpose of the protected zone is required before implementation of extractive activities.

Table 1a. IP for mining activities in PZ "Rhodopes – Eastern"

Decision	Institution	Subject	Name	Area, ha	Land	Municipality	District
01-OC/2010 for preparing Natura Assessment	MEW	Research and Exploration	Tiklite	12	s.Brusino	Ivajlovgrad	Haskovo
20-OC/2010 Agreement for Natura Assessment	MEW	Research and Exploration	Plaki	3	s.Kobilino	Ivajlovgrad	Haskovo
21-OC/2010 Agreement for Natura Assessment	MEW	Research and Exploration	Aglikina poljana	260	s.Egrek, s.Goljam devisil, s.Devisil	Krumovgrad	Kyrdzhali
24-OC/2009 agreement without Natura Assessment	MEW	Research and Exploration	Dybova korija	9,4	s.Lozengradci	Kirkovo	Kyrdzhali
25-OC/2010 for preparing Natura Assessment	MEW	Research and Exploration	Chervenijat dol	13	s.Sokolenci	Ivajlovgrad	Haskovo
26-OC/2010 for preparing Natura Assessment	MEW	Research and Exploration	Sarachevata zvezda	24	Ivajlovgrad	Ivajlovgrad	Haskovo
43-OC/2009 agreement without Natura Assessment	MEW	Research and Exploration	Zheljznata vrata 3	18	s.Sedlovina	Kyrdzhali	Kyrdzhali
44-OC/2008 agreement without Natura Assessment	MEW	Research and Exploration	Brusino-jug	252	s.Brusino, s.Zhelezino, s.Cherni rid, s.Planinec, s.Nova livada	Ivajlovgrad	Haskovo
44-OC/2010 for preparing Natura Assessment	MEW	Research and Exploration	Gankinata pyteka	15	s.Kobilino	Ivajlovgrad	haskovo
45-OC/2008 agreement without Natura Assessment	MEW	Research and Exploration	Pystrook	983	s.Pystrook, s.Zhelezino	Ivajlovgrad	Haskovo
45-OC/2010 for preparing Natura Assessment	MEW	Research and Exploration	Jankovija kladenc	46,8	s.Cherni rid	Ivajlovgrad	Haskovo
46-OC/2008 agreement without Natura Assessment	MEW	Research and Exploration	Kobilino-jug	2200	s.Cherni rid, s.Kobilino, s.Zhelezino, s.Pokrovan, s.Plevun	Ivajlovgrad	Haskovo
51-OC/2010 agreement without Natura Assessment	MEW	Research and Exploration	Kesebir	19800	Krumovgrad	Krumovgrad	Haskovo
56-OC/2008 agreement without Natura Assessment	MEW	Research and Exploration	Malkata reka	6,2	s. Lozengradci	Kirkovo	Kyrdzhali
57-OC/2008 agreement without Natura Assessment	MEW	Research and Exploration	Sapetlieva niva	8,07	s.Kobilino	Ivajlovgrad	Haskovo
58-OC/2008 agreement without Natura Assessment	MEW	Research and Exploration	Razklona	14,2	s.Cherni rid	Ivajlovgrad	Haskovo
63-OC/2010 for preparing Natura Assessment	MEW	Research and Exploration	Boruna	36	s.Pokrovan	Ivajlovgrad	Haskovo



84-OC/2009 for preparing Natura Assessment	MEW	Research and Excploation	Pyrzhenaka 1	14,2	s.Cherni rid	Ivajlovgrad	Haskovo
91-OC/2008 agreement without Natura Assessment	MEW	Research and Excploation	Ganchovija chukar	10,2	s.Kobilino	Ivajlovgrad	Haskovo
107-OC/2009 agreement without Natura Assessment	MEW	Research and Excploation	Duvan dere	270	s. Sokolino, s. Obichnik, s.Pleshinci	Momchilgrad	Haskovo
109-OC/2009 agreement without Natura Assessment	MEW	Research and Excploation	Potochnica	100 ha	s.Rabovo, s.Potochnica	Stambolovo, Krumovgrad	Haskovo, Kyrdzhali
110-OC/2009 agreement without Natura Assessment	MEW	Research and Excploation	Dzheni	37 ha	s.Gluhar	Kyrdzhali	Kyrdzhali
112-OC/2009 agreement without Natura Assessment	MEW	Research and Excploation	Djulina mahala	30 ha	s.Zhelezino	Ivajlovgrad	Haskovo
121-OC/2010 Agreement for Natura Assessment	MEW	Research and Excploation	Karadzhejka	75	s.Cherni rid, s.Kobilino	Ivajlovgrad	Haskovo
125-OC/2010 for preparing Natura Assessment	MEW	Research and Excploation	Sulica 1	20	s.Sindelci, s.Batkovci	Momchilgrad	Kyrdzhali
126-OC/2010 for preparing Natura Assessment	MEW	Research and Excploation	Gichita	23	s.Pokrovan	Ivajlovgrad	Haskovo
130-OC/2010 agreement without Natura Assessment	MEW	Research and Excploation	Hubavec	956	Momchilgrad	Momchilgrad	Kyrdzhali
XA-33-OC/2009 agreement without Natura Assessment	RIEW Haskovo	Building of quarry	Fabrika-3	2.73	s.Kobilino	Ivajlovgrad	Haskovo
XA-74-OC/2009 agreement without Natura Assessment	RIEW Haskovo	Building of quarry	Fabrika-2	8	s.Kobilino	Ivajlovgrad	Haskovo
XA-75-OC/2009	RIEW Haskovo	Building of quarry	Fabrika-4	2	s.Kobilino	Ivajlovgrad	Haskovo
XA-6-PP/2009 agreement without Natura Assessment	RIEW Haskovo	Building of quarry	Melnicata	9	s.Zhelezino	Ivajlovgrad	Haskovo
XA-7-PP/2010 agreement without Natura Assessment	RIEW Haskovo	Extraction of aggregates	r. Kesebir	1,5	s.Tihomir	Kirkovo	Kyrdzhali
XA-13-PP/2010 agreement without Natura Assessment	RIEW Haskovo	Building of quarry	Malamarska cheshma	10,7	s.Kamilski dol	Ivajlovgrad	Haskovo
XA-21-OC/2009 agreement without Natura Assessment	RIEW Haskovo	Further Development of quarry	Kolibar cheshma	6.72	Ivajlovgrad	Ivajlovgrad	Haskovo
XA-21-PP/2009 agreement without Natura Assessment	RIEW Haskovo	Further Development of quarry	Sveti Ilija	3839,6	s.Kobilino	Ivajlovgrad	Haskovo
XA-22-PP/2009 agreement without Natura Assessment	RIEW Haskovo	Building of quarry	Gabyra	7,56	s.Cherni rid	Ivajlovgrad	Haskovo



XA-24-OC/2010 agreement without Natura Assessment	RIEW Haskovo	Extraction of aggregates from Krumovitsa river	Krumovica	4,59	s.Ovchari	Krumovgrad	Kyrdzhali
XA-30-OC/2010 agreement without Natura Assessment	RIEW Haskovo	Drilling sites	Skalak	0,015	s.Skalak	Krumovgrad	Kyrdzhali
XA-38-PP/2010 agreement without Natura Assessment	RIEW Haskovo	Extension of acting quarry	Kazarmata	5,36	s.Cherni rid	Ivajlovgrad	Haskovo
XA-38-PP/2009 agreement without Natura Assessment	RIEW Haskovo	Exploitation of quarry	Jankova cheshma	10,05	s.Nova livada	Ivajlovgrad	Haskovo
XA-39-PP/2009 agreement without Natura Assessment	RIEW Haskovo	Building of quarry	Dybaka	8,78	s.Kobilino	Ivajlovgrad	Haskovo
XA-60-PP/2009 agreement without Natura Assessment	RIEW Haskovo	Building of quarry	Kamynite	18,9	s.Zhelezino	Ivajlovgrad	Haskovo
XA-61-PP/2009 agreement without Natura Assessment	RIEW Haskovo	Building of quarry	Bojchovata krusha	20,9	s.Zhelezino	Ivajlovgrad	Haskovo
XA-61-PP/2008 agreement without Natura Assessment	RIEW Haskovo	Building of quarry	Hadzhieva cheshma	0,78	s.Svirachi	Ivajlovgrad	Haskovo
XA-84-PP/2008 agreement without Natura Assessment	RIEW Haskovo	Recovery of quarry	Belite kamyni	30	s.Cherni rid	Ivajlovgrad	Haskovo
XA-109-PP/2009 agreement without Natura Assessment	RIEW Haskovo	Exploitation of quarry	Gramatikovata saja	6,94	s.Pokrovan	Ivajlovgrad	Haskovo
XA-165-PP/2008 agreement without Natura Assessment	RIEW Haskovo	Extraction of natural stone materials	Korumhale	18,4	s.Zhelezino	Ivajlovgrad	Haskovo
XA-191-PP/2008 agreement without Natura Assessment	RIEW Haskovo	Disclosure of quarry	Naredenite kamyni	23,4	s.Kamilski dol	Ivajlovgrad	Haskovo

2. Other investment proposals and issued decisions for building of other infrastructure, wind park, photovoltaic systems, extraction of inert materials from river beds, rehabilitation of roads, construction of villas, etc. – total 111. Some of them are presented above (table 1b). More significant cumulative negative effect on protected zone is expected from IP for photovoltaic systems, windparks, mini hydropower plants, as this type of IP being realized usually on green fields.

Table 1b. Other IP in PZ "Rhoropes – Eastern"

Decision	Institution	Subject	Name	Area, ha	Land	Municipality	District
XA-53-PP/2009 agreement without Natura Assessment	RIEW Haskovo	Extraction of inert materials	r.Krumovica	N/A	s.Potochnica	Krumovgrad	Kyrdzhali
XA-77-PP/2008 agreement without Natura	RIEW Haskovo	Building of quarry	Chakyrov drjan23,9 ha	N/A	s.Kamilski dol	Ivajlovgrad	Haskovo





Assessment							
XA-91- ПР/2009 agreement without Natura Assessment	RIEW Haskovo	Extraction of inert materials	r.Arda r.Krumovica	N/A	s.Rabovo, s.Dolno cherkovishte	Stambolovo	Haskovo
XA-103- ПР/2009	RIEW Haskovo	Extraction of inert materials	r.Krumovica	N/A	s.Lulichka, s.Vransko	Krumovgrad	Kyrdzhali
XA-8- ПР/2009 agreement without Natura Assessment	RIEW Haskovo	Mineral water bottling plant	Cherni rid	N/A	s.Cherni rid	Ivajlovgrad	Haskovo
XA-12- ЕО/2010 agreement without Natura Assessment	RIEW Haskovo	Building of photovoltaic system	Kantona	0,99	s.Cherni rid	Ivajlovgrad	Haskovo
XA-12- ЕО/2010 agreement without Natura Assessment	RIEW Haskovo	Building of furnace for wooden coals	Mandrica	0.175	s.Mandrica	Ivajlovgrad	Haskovo
XA-16- ОС/2008	RIEW Haskovo	Building of Изграждане на вилно селище	Lensko	1,21	s.Lensko	Ivajlovgrad	Haskovo
XA-20- ЕО/2010 agreement without Natura Assessment	RIEW Haskovo	Building of photovoltaic system	Avzhika	4,2	s.Topolovo	Madzharovo	Haskovo
XA-25- ЕО/2009 agreement without Natura Assessment	RIEW Haskovo	Building of country houses	Rabovo	1,65	s.Rabovo	Stambolovo	Haskovo
XA-68- ОС/2009 agreement without Natura Assessment	RIEW Haskovo	Building of windpark	Pazarci	N/A	s.Pazarci	Momchilgrad	Kyrdzhali
XA-114- ПР/2009 for preparing Natura Assessment	RIEW Haskovo	Building of mini hydropower plant	Arda	N/A	Madzharovo	Madzharovo	Haskovo
XA-115- ПР/2009 for preparing Natura Assessment	RIEW Haskovo	Building of mini hydropower plant	Arda	N/A	Madzharovo	Madzharovo	Haskovo
XA-149- ПР/2008 agreement without Natura Assessment	RIEW Haskovo	Building of photovoltaic system	Pelin, Kachulka, Perunika	18,63	s.Pelin, s.Kachulka, s.Perunika	Krumovgrad	Kyrdzhali
XA-02- 01/2009 Agreement for Natura Assessment	RIEW Haskovo	Building of windpark	Popsko, Pashkul	12,56	s.Popsko, s.Pashkul	Ivajlovgrad	Haskovo



XA-03-01/2009 Agreement for Natura Assessment	RIEW Haskovo	Building of windpark	Pelin, Perunika, Kachulka	15,7	s.Pelin, s.Kachulka, s.Perunika	Krumovgrad	Kyrdzhali
XA-05-01/2009 Agreement for Natura Assessment	RIEW Haskovo	Building of windpark	Chal, Kachulka	15,7	s.Chal, s.Kachulka	Krumovgrad	Kyrdzhali
XA-06-01/2009 Agreement for Natura Assessment	RIEW Haskovo	Building of windpark	Pelin, Rogach, Kachulka, Polkovnik zheljazovo	43,2	s.Pelin, s.Rogach, s.Kachulka, s.Polkovnik Zheljazovo	Krumovgrad	Kyrdzhali
XA-07-01/2009 Agreement for Natura Assessment	RIEW Haskovo	Building of windpark	Mom4ilgrad, s.Gruevo, s.Man4evo, s.Ple6nici, s.5obanka	5,9	Mom4ilgrad, s.Gruevo, s.Man4evo, s.Ple6nici, s.5obanka	Mom4ilgrad	K2rdjali

Based on the researches and this report for IP "Extraction and Processing of Gold-Bearing Ore from the Krumovgrad Exploration Area" (Alternative 1) and the information gathered from MEW and RIEW Haskovo can be made following conclusions about potential direct or cumulative impact along with other IP:

Alternative 1 minimizes the impact on conservation objectives of the protected zone by optimized spatial orientation of the elements and fulfilled requirements for timeline and continuance of the impact during the construction and operation stages. With that the impact on habitats and fauna which are conservation objectives of the zone reduces to low levels.

There is no other IP located directly near to this IP which could have cumulative effect on the site.

The impact of this IP even insignificant is only local and viewed as on the zone it is too low, which leads to the conclusion that IP "Extraction and Processing of Gold-Bearing Ore from the Krumovgrad Exploration Area" (Alternative 1) in combination with other IP do not contribute for augmentation of the cumulative negative impact in the protected zone.

### **2.3. Description of elements of the investment proposal, which alone or in combination with other PPP/IP may affect the protected zones.**

#### **2.3.1. Elements of the proposal, which alone or in combination with other PPP/IP may affect the protected zone.**

##### **Development of an open pit mine Ada Tepe with an area of 17 ha:**

- Direct destruction and deterioration of habitats (destruction of dry meadows, herbaceous and forest communities, removal of the surface soil layer together with all living organisms that characterize the specific habitat and increasing the anthropogenic influence, in effect turning it into another type of habitat).
- Mortality of individual specimens (direct destruction during the site development of the population of species, typical for the habitat).
- Fragmentation of habitats.
- Noise pollution (noise and powerful ground vibrations) causing disturbance of animals.
- Air pollution (fugitive dust and gas emissions (nitrogen oxides) - impacts on plant species and plant communities - physiological and biochemical reactions of pollution on organism level.
- Light pollution - nocturnal animals attracted by light sources, causing disorientation and potentially incidents resulting in death.
- Increased risk of fires (presence of explosives, fuel, lubricants, lighting, operating engines, electricity lines, disposal of cigarette buds, etc.).



- ✦ Risk of incidental contamination in the event of accidents, landslides.
- ✦ Disturbance of animals as a result of increased human presence, use of ground excavation equipment and explosions.

### **Construction of landfills for soil materials (2 ha) and stock piles for rocks (3 ha) with a total area of 5 ha:**

- ✦ Direct destruction or damage of habitats.
- ✦ Deterioration of habitats quality (deterioration of the state of food habitats and alteration of the soil communities):
  - The destruction of the primary vegetation, clear cutting of old trees;
  - The cleaning up of bush and tree vegetation in the area of the IP will increase the erosion and the amount of particles in Krumovitsa River, which in turn will have a negative effect on the photosynthetic processes of plant organisms in the water, and consequently, on the trophic base of clams in the region.
  - Due to the sharp increase in CO<sub>2</sub> in the soil resulting from the pressure of deposited rock and soil masses and heavy machinery traffic.
- ✦ Interruption of important ecotones and disruption of access to key habitats.
- ✦ Mortality of individual specimens (destruction of the population of species, typical for the habitat).
- ✦ Disturbance of species vulnerable to increased human presence.
- ✦ Air (generation of fugitive dust and gas emissions) - impacts on plant species and plant communities - physiological and biochemical reactions caused by pollution on organism level, changes in species composition at the plant communities or groups level.
- ✦ Noise (generation of energy pollutants - noise and vibration) and light pollution during construction and operation.
- ✦ Pollution with building and municipal solid waste, incl. pollution of neighbouring areas.

### **Road infrastructure with an area of 12 ha:**

- ✦ Fragmentation of the biological corridors and disturbance of species vulnerable to increased human presence. Outside the zone may also contribute to the fragmentation of the biological corridors, especially if the road infrastructure is burdened with heavy traffic.
- ✦ Deterioration of the status of food habitats and the food base by destruction or contamination of the primary vegetation resulting from dust and technogenic pollution.
- ✦ Mortality of individual specimens (e.g. caused by collision with vehicles).
- ✦ Noise pollution (causing anxiety and disturbance of animals).
- ✦ Light pollution (disturbance or attraction of animals to roads and light sources on and in proximity to roads; directly leading to increased mortality).
- ✦ Air pollution – caused by dust, nitrogen and sulphur oxides, polycyclic aromatic hydrocarbons, ozone and other secondary photochemical pollutants, lead, cadmium - resulting in impacts on plant species and plant communities, such as physiological and biochemical reactions caused by pollution at organism level, changes in species composition at the plant communities or groups level; toxic effect, nitrification.
- ✦ Soil contamination from rain, snow and irrigation water washing off oil, petrol and diesel from road surfaces, etc.
- ✦ Increased risk of fire (presence of explosives, fuel, lubricants, lighting, working engines, electricity lines, disposal of cigarette buds, etc.).
- ✦ Risk of incidental contamination in road accidents, especially when it rains, or in the vicinity of the Krumovitsa River. Especially dangerous can be pollution resulting from the transportation of chemical compounds used in the extraction technology (cyanides, chlorides, sulphates, borax) and that can cause mortality of individual specimens and permanent contamination of the soil layer.
- ✦ Disturbance of animals as a result of increased human presence.
- ✦ Facilitated invasion of foreign species in the habitats.



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### **Construction of tank for turnover water and 2 pcs. assembly shafts (near to mining waste facility) with total area of 4 ha:**

- ✦ Deterioration of the status of food habitats resulting from the destruction of the primary vegetation cover.
- ✦ Fragmentation of biological corridors and disturbance of animal species vulnerable to increased human.
- ✦ Barrier for periodic, seasonal or perennial migration of animals and habitat fragmentation.
- ✦ Deterioration of the quality of neighboring habitats.
- ✦ Light pollution caused by lighting equipment.

### **Building a plant for production of gold with a surface area of 6 ha:**

- ✦ Deterioration of the status of food habitats through destruction of the primary vegetation layer.
- ✦ Fragmentation of habitats.
- ✦ Interruption to important ecotones and disruption of the access to key habitats (mortality, disturbance, insurmountable obstacles such as engineering equipment).
- ✦ Deterioration of the quality of neighboring habitats.
- ✦ Noise (generation of energy polluters - noise and vibration) during construction and operation.
- ✦ Air pollution during the construction and operation.
- ✦ Light pollution caused by lighting equipment.
- ✦ Soil contamination from rain, snow and irrigation water.
- ✦ Increased risk of fires (presence of explosives, fuel, lubricants, lighting, working engines, electricity lines, disposal of cigarette buds, etc.).
- ✦ Disturbance of animals caused by increased human presence.

### **Construction of a disposal facility for mining waste – 41 ha:**

- ✦ Direct destruction and/or damage to food habitats because of dramatic alteration of the environmental characteristics.
- ✦ Fragmentation of habitats, interruption of important ecotones and of the access to key habitats, disruption of local migration corridors; barrier for periodic, seasonal or perennial migration of animals (mortality, disturbance, insurmountable obstacles such as engineering equipment).
- ✦ Disturbance of animals caused by increased human presence.
- ✦ Mortality of individual specimens (e.g. caused by collision with vehicles). Air (generation of fugitive dust and gas emissions during the construction, operation, closure and reclamation) - impacts on plant species and plant communities - physiological and biochemical reactions caused by pollution on the organism level, changes in species composition at the plant communities or groups level; easier spread of viruses, spores and eggs of parasitic species through dust emissions, whose potential may be exhibited in a distance of 100 to 1000 meters from the site of the dust generating activities).

### **Greening and reclamation activities**

- ✦ Change of habitats' structure and species composition, making them unsuitable for the protected species.
- ✦ Air pollution (fugitive dust and gas emissions).
- ✦ Invasion of aggressive species (influx of invasive foreign, invasive and synanthropic animals and of invasive weed and ruderal plant species), causing change in the species structure in the habitat and may worsen the conservation status condition as these aggressive species can be enemies and competitors of protected species of plants and animals, typical for the habitat.



**Table 1.** The relationship between elements of the investment proposal and its impacts arising from potential impacts on the habitats and species and findings on the possibility to assess these impacts at this planning stage and the need for conditions for the next planning stages

Element of the project for non-hazardous waste landfill	Potential impacts	Planning stage and impact assessment
Development of an open pit gold mine incl. ancillary facilities – stock piles, tanks for turnover water, landfill for soil materials, landfill for mining waste and etc.	<ul style="list-style-type: none"> <li>✦ Direct damage or destruction of habitats.</li> <li>✦ Mortality of individual specimens (destruction of populations of species, typical for the habitat, during the construction).</li> <li>✦ Damage to the landscape, reduction of the environmentally friendly options for sustainable development of the protected zones (nature tourism, agricultural lands).</li> <li>✦ Disturbance of animals caused by increased human presence.</li> <li>✦ Pollution with building and municipal solid waste, including pollution of neighbouring land.</li> <li>✦ Disruption of the water balance of meadows and pastures as a result of drying up.</li> </ul>	Impact assessment at this planning stage; conditions for implementing the next planning stage
Accompanying engineering constructions - fences, erosion preventing constructions, drainage facilities, water pipelines, power lines and others.	<ul style="list-style-type: none"> <li>✦ Direct destruction of habitats.</li> <li>✦ Barrier for periodic, seasonal or perennial migration of animals and habitat fragmentation.</li> <li>✦ Deterioration of the quality of neighbouring habitats.</li> <li>✦ Damage to the landscape, reduction of the environmentally friendly options for sustainable development of the protected zones (nature tourism, agricultural land).</li> </ul>	Impact assessment at this planning stage; conditions for implementing the next planning stage
Increased anthropogenic influence resulting from the operation of the mine and ancillary facilities	<ul style="list-style-type: none"> <li>✦ Destruction of habitat structure and of the neighbouring areas as a result of heavy machinery traffic.</li> <li>✦ Noise pollution (disturbance of animals).</li> <li>✦ Light pollution caused by lighting equipment.</li> <li>✦ Increased risk of fire.</li> <li>✦ Risk of incidental pollution caused by accidents in the infrastructure.</li> <li>✦ Reduction of the options for sustainable development of the protected zones.</li> <li>✦ Disturbance of animals caused by increased human presence.</li> <li>✦ Increased presence of species untypical for the habitat and risk of influx of invasive species.</li> <li>✦ Disruption of the water balance of meadows and pastures as a result of drying up, flooding and others.</li> <li>✦ Water and land contamination with sewage and waste, probably generated by the landfill.</li> </ul>	Impact assessment at this planning stage; conditions for implementing the next planning stage
Greening and reclamation activities	<ul style="list-style-type: none"> <li>✦ Influx of aggressive species, damage to natural habitats (species composition).</li> <li>✦ Change of habitats' structure and species composition, making the habitats unsuitable for the protected species.</li> </ul>	Conditions for implementing the next planning stage.



### 2.3.2. Likely impacts on habitats

#### **Direct impacts**

##### ***Habitat destruction***

Direct destruction of habitat caused by construction work related to the excavation of rock and soil, clear cutting and eradication of natural or semi-natural vegetation, swamping caused by the disposal of waste from extractive activities onto natural or semi-natural vegetation, change of the hydrological regime of wetlands, damage in the course of construction and maintenance of infrastructure.

##### ***Mortality of individual specimens***

Mortality of individual specimens caused by the direct destruction of their habitats, including by the operation of the mine and maintenance of the infrastructure within the areas of the natural distribution of the species' populations, the increase of the populations of invasive species - competitors or enemies of protected plant species, creation of barriers and fragmentation of species' habitats and thereby damaging their populations.

##### ***Barriers to the normal functioning of habitats***

Creating barriers - excavations, fences, strengthening constructions and drainage system, electricity lines, roads, water pipelines- that fragment habitats and populations, hinder or completely interrupt the cyanotic and genetic exchange between them and lead to deterioration of their conservation situation.

#### **Indirect impacts**

##### ***Deterioration of adjacent habitats cause of disturbing (noise and light pollution), changing parameters of the environment.***

Noise and light pollution, increased anthropogenic extraction activities in the presence and operation of facilities (mine, landfills, water pipelines and etc.) in adjacent areas, resulting in displacement of individuals, damage to the normal population structure.

##### ***Increased risk of fires***

Increased risk of fires is associated with the mine operation, maintenance of infrastructure and movement of heavy machinery and other equipment. Fires could lead to direct destruction of protected species and habitats.

##### ***Risk of incidental pollution in the event of accidents in the built infrastructure***

Incidental air pollution, water and soil contamination resulting from accidents within the existing and newly built infrastructure, unsatisfactory safety levels at the mine can lead to mortality of individual specimens, deterioration of the environmental parameters, destruction of habitats and risk of fires.

##### ***Influx of invasive foreign species in natural habitats***

The construction and operation of the mine and especially in the reclamation of sites of this type, the development of green areas, use of buildings and facilities and the movement of large groups of people can lead to the introduction of alien, invasive and synanthropic animals and invasive weed and ruderal plant species that will change the species structure in the habitat and may cause deterioration of the conservation status as they can be enemies and competitors of protected plant and animal species and of plant and an animal species, typical for the habitat.

##### ***Reduction of the opportunities for sustainable development of the protected zones***

The creation of anthropogenic landscapes (associated with rake and disposal of large soil and rock masses at that) permanently destroys the uniqueness of the natural components and significantly reduces the opportunities for sustainable type of tourism that aims to expose the natural characteristics of the region, which includes the protected species and habitats.



### 2.3.3. Likely impacts on the invertebrate fauna.

#### **Direct impacts**

##### ***Habitat destruction***

Direct destruction of habitats due to construction work related to excavation of rock and soil masses, clear cutting and eradication of natural or semi-natural vegetation, the construction of embankments and swamping of natural or semi-natural vegetation with waste from mining activities, filling gullies, flooding due to construction of microdams, alteration of the hydrological regime of wetlands, damage resulting from the development and maintenance of infrastructure.

##### ***Mortality of individual specimens***

Mortality of individual species caused by direct destruction of their habitats, incl. in the course of operation of the mine and related facilities and maintenance of infrastructure within the natural distribution of their populations. Possible mortality resulting from increase in the population of invasive species - competitors or enemies of protected plant and animal species. Damage to the population of species through the creation of barriers and fragmentation of their habitats (interruption of important ecotones and of the access to key habitats) and consequently damage their populations.

Increased mortality results from increased road traffic - collision with cars and trucks. Most vulnerable are large, heavy beetles and butterflies. Nocturnal species often take the roadway or are drawn by the headlights of vehicles and become easy victims.

##### ***Disturbance of animals caused by increased human presence***

Noise and light pollution, increased anthropogenic presence in the operation of the mine in a relatively large area leads to disturbance of individual specimens and damage to the normal population structure.

##### ***Barriers to the normal functioning of habitats***

Creating barriers - excavations, fences, strengthening constructions, drainage infrastructure, power lines, roads, water supply, settling tanks fragment habitats and populations, interrupt or destroy important ecotones and the access to key habitats, hinder or completely interrupt the cynotic and genetic exchange between habitats and lead to deterioration of their conservation status and to disturbance and mortality of individual species.

#### **Indirect impacts**

##### ***Deterioration of the quality of neighboring habitats as a result of disturbance (noise and light pollution)***

Noise and light pollution, increased anthropogenic presence related to the mining activities and the operation of related facilities (stock piles, water pipes and electricity lines) result in disturbance of individual specimens, damage to their normal population structure and of areas neighbouring the IP.

Automobile traffic is also a factor for the significant disturbance of invertebrates in the areas adjacent to the road infrastructure of the investment proposal. On the one hand this is associated with the continuous presence of moving objects (cars) (respectively - human presence), on the other - with the generation of considerable noise. Due to the characteristics of the terrain in the area, noise pollution will affect a larger area. Noise pollution and disturbance have an expressed cumulative effect in areas where road infrastructure routes pass close to elements of the IP, human settlements or other roads and it is possible, in a worst-case scenario, to lead to a deterioration of habitats to the extent the habitats can no longer be used by the invertebrates species, although the habitats themselves continue to exist.

##### ***Deterioration of the quality of food habitats and the food base as a result of water contamination from road surfaces***

Snow, rain and irrigation water washing off oil, gasoline, diesel, etc., from the road surface can cause soil contamination and thereby adversely affect components of the respective food chains.



### **Increased risk of fires**

Increased risk of fires is associated with the mine operation, maintenance of infrastructure and movement of heavy machinery and other equipment and could lead to direct destruction of protected species and habitats.

### **Risk of incidental contamination from accidents in the built infrastructure**

Within the EIA cannot be assessed what will be the probability of accidents. Due to the nature of business – flotation and small amount of flotation reagent – it is considered that the probability of accidents with significant consequences for the environment is negligible.

### **Influx of foreign species in natural habitats**

In the construction and operation of the mine and especially in the reclamation of sites of this type, the creation of green areas, use of buildings and facilities, and the movement of large groups of people can lead to the introduction of alien, invasive and synanthropic animals and invasive weed and ruderal plant species that will change the habitat's species structure and may cause deterioration of the conservation status as these can be enemies and competitors of protected invertebrates species and of other species, typical for the habitat.

**The creation of anthropogenic landscape** (linked to raking out and disposing of large volumes of soil and rocks) permanently damages the unique natural components and significantly reduces the opportunities for sustainable tourism that aim to promote the natural characteristics of the region, which include protected species and habitats.

Furthermore, artificially created plant communities in reclamation areas cannot compensate for the loss of habitat. Destruction of ecotone area due to expansion of the anthropogenic landscape is also expected. Disturbance of the physical characteristics will lead to a change in the composition of plant communities and of connected organisms, which in turn will result in the inability of species to find suitable conditions for their growth and feeding (e.g. *Callimorpha quadripunctaria*).

## **2.3.4. Likely impacts on reptiles and amphibians**

### **Direct impacts**

#### **Habitat destruction**

Direct destruction of habitats due to construction work related to the excavation of rock and soil masses, clear cutting and eradication of natural or semi-natural vegetation, the construction of embankments and swamping of natural or semi-natural vegetation with waste from mining activities, filling gullies, flooding due to construction of microdams, alteration of the hydrological regime of wetlands, damage resulting from the development and maintenance of infrastructure.

#### **Mortality of individual specimens**

Mortality of specimens caused by direct destruction of their habitats, incl. in the course of the operation of the mine and related facilities and maintenance of infrastructure within the natural distribution of the species' populations. Damage to the population of species through the creation of barriers and fragmentation of their habitats (interruption of important ecotones and disruption of the access to key habitats). Increased mortality resulting from increased road traffic - collision with cars and trucks.

#### **Barriers to the normal functioning of habitats**

Creating barriers - excavations, fences, strengthening constructions, drainage systems, electricity lines, roads, water supply, settling tanks fragment habitats and populations, interrupt or destroy important ecotones and disrupt the access to key habitats, hinder or completely interrupt the cynotic and genetic exchange between habitats and lead to deterioration of their conservation status and to disturbance and mortality of individual specimens.

### **Indirect impacts**





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***Deterioration of the quality of food habitats and of the food base as a result of water contamination from road surfaces***

Snow, rain and irrigation water washing off oil, gasoline, diesel from the road surface can cause soil contamination, and thereby adversely affect components of the respective food chains.

***Increased risk of fire***

Increased risk of fire in the mine operation, maintenance of infrastructure and movement of heavy machinery and other equipment could lead to direct destruction of protected species and habitats.

***Risk of incidental contamination from accidents in the built infrastructure***

IP does not require use of toxic reagents and in this way it is considered that risk of accidental pollution is not significant.

**2.3.5. Likely impacts of the investment plan on ichthyofauna**

**Direct impacts**

***Deterioration of the quality of the habitat***

Disturbance of the natural water balance of Krumovitsa River.

Increase in the soil erosion in the region, following the development of the IP, which will lead to increased inflow of solid particles in the river and increased turbidity.

***Habitat loss and mortality of individual specimens***

Not expected under the technology for extraction, according to technical information.

**Indirect impacts**

***Danger of incidental pollution resulting from accidents in the infrastructure***

In varying degrees, a risk of contamination exists in the following phases of the production process:

- 🔦 Accident which may lead to release of greater amount of water under intense rainfall and the transport of reagents;

***Influx of invasive foreign species***

The construction, operation and in particular the reclamation of sites of this type are associated with the creation of artificial water bodies where the introduction of foreign invasive species that alter the species structure of habitats, cause deterioration of environmental condition and can be enemies and competitors of protected autochthonous fish species fish is possible.

**2.3.6. Likely impacts on mammals**

The expected impacts of the investment proposal on mammals are described below.

**Direct impacts**

***Destruction of habitats.***

The construction of the mine and associated facilities will result in direct and irreversible destruction at the construction sites of habitats of small rodents used for food by small predators of the ferrets family (martens and black minks), foxes, wolves and others. Of these protected species, in the Eastern Rhodope zones there will be a direct impact on the food base and places for hiding of the wolf – such as



disturbance and destruction of habitats of deer and rabbits, which represent its main food base. This impact is relatively small based on the fact that the individual territory of a wolf pack is over 150 km<sup>2</sup>. Noise levels and the presence of machinery and equipment will disturb the large mammals in the area of the IP in the habitats that will not be directly destroyed. The food habitats of bats in the region will also be directly destroyed and damaged.

### ***Habitat fragmentation***

Currently Ada Tepe is a habitat of insular nature with a high level of fragmentation with respect to large mammals. The presence of many human settlements and arable land in the immediate vicinity makes Ada Tepe a place with a strongly expressed anthropogenic influence. This defines Ada Tepe as a habitat of low quality for large prey mammals.

### ***Mortality of individual specimens***

The types of large mammals, subject to this CA, are fast-moving and have well-developed senses. The likelihood of direct destruction is negligible. Systematic pouring of waste water with low toxicity would lead to cumulative effect on aquatic organisms. Direct mortality is not expected.

### ***Disturbance of mammals caused by increased human presence***

Since most wild mammals are highly sensitive to human presence, increase in this presence will drive them out of the region of the gold mine.

## **Indirect impacts**

### ***Deterioration of the quality of neighbouring habitats as a result of disturbance***

Besides the direct destruction of habitats, the disturbance caused by human presence and activities in the area of the investment proposal is the most significant impact on mammals. The disturbance is caused by the so-called noise pollution – conversations of people in the vicinity, noise from the movement of vehicles, etc.

Light pollution is caused by lighting equipment. Light from lighting equipment causes significant disturbance and drives away protected animals from the area. This is a long-term and permanent effect and is cumulative with other indirect effects, such as noise and human presence.

### ***Deterioration of the quality of neighbouring habitats as a result of the disruption of the water balance.***

Drainage of underground water and construction of artificial lakes will cause a direct change in water balance in the affected area and in neighbouring areas. This will directly lead to the loss of habitats of the species living in or near water.

## **2.3.7. Possible cumulative impacts**

### **Cumulative impact associated with significant traffic, noise pollution and others.**

This impact is particularly strong in areas where routes pass near the elements of the investment proposal, human settlements, industrial areas, other roads or areas with intensive agriculture and reclamation. In the worst case scenario, it is possible to lead to deterioration of the habitats to the extent they cannot be used by the respective invertebrates, despite the fact that the habitats remain structurally and functionally unchanged.

However, in zone level is not expected strong cumulative effect do to the characteristics of the IP

## **2.3.8. Summary of possible types of impacts arising from the investment proposal**

**Table 2.** Summary of the possible types of impacts arising from the investment proposal and:

- their coverage in view of their location with respect to the protected zone;
- project phase, at which they are likely to occur; with respect to their impact on habitats and species: whether they will have a long-term impact or temporary effect; with respect to the



duration of the impacts: whether the impacts are permanent, short-term, periodical, incidental (i.e. they would not necessarily occur);

- together with which other impacts of the investment proposal they have a combined impact on a FCS parameter for species and habitats. The links between direct impacts must be assessed. Their combined effect will be assessed at a later stage.
- other plans, programs and investment proposals in combination with which the investment proposal may have a cumulative impact.

Type of impact	Scope of the impact (within/outside the zone)	Impact phase Duration Frequency	Possible combined impacts	Possible cumulative impacts (other projects)
Direct destruction of habitats	Within the zones.	Construction and operation of the mine  Long-term, permanent and irreversible	Permanent damage to the quality of neighbouring habitats in the course of the mine's operation resulting from: <ul style="list-style-type: none"> <li>• Disruption to individual specimens due to noise and light pollution and/or increased human presence.</li> <li>• Interruption of important ecotones and disruption of the access to key habitats (mortality, disturbance, insurmountable obstacles such as engineering constructions).</li> <li>• Fragmentation of habitats and isolation of small otherwise suitable habitats (mortality, disturbance, insurmountable obstacles such as engineering constructions).</li> <li>• Destruction of the ecotone zone due to expansion of the anthropogenic landscape.</li> </ul>	Landfills for rock and soil materials, ponds, etc., existing infrastructure and urban system
Habitat fragmentation	Within the zones.	Construction and Operation  Long-term and permanent	<ul style="list-style-type: none"> <li>• Disturbance of individual species resulting from noise and light pollution and / or increased human presence.</li> <li>• Direct destruction of habitats;</li> <li>• Destruction of an ecotone zone due to expansion of the anthropogenic landscape</li> </ul>	Landfills for rock and soil materials, ponds, etc., existing infrastructure and urban system
Mortality of individual specimens	Within and outside the zones (fragmentation of biological corridors)	Construction/Operation  Short-term during construction  Long-term, periodical, irrevocable during operation	<ul style="list-style-type: none"> <li>• Destruction of the population of typical species and deterioration of the FCS</li> <li>• Fragmentation and damage to habitats by interruption of important ecotones and of the access to key habitats;</li> <li>• Interruption of biological corridors for migration/distribution of species.</li> </ul>	Landfills for rock and soil materials, ponds, etc., existing infrastructure and urban system
Disturbance of animals as a result of increased human presence	Within the zones (deterioration of the quality of the habitats and fragmentation of	Construction/Operation  Long-term	Combined effect on the quality of habitats and can contribute to the damage and interruption of the biological corridors.	Landfills for rock and soil materials, ponds, etc., existing infrastructure and urban system



	biological corridors).	Permanent		
Engineering structures that constitute obstacles to the proper functioning of habitats	Within the zone	Construction/ Operation  Long-term Permanent	Combined effect on the quality of habitat (interruption of ecotones and of the access to key habitats, fragmentation and isolation of small habitats).	Landfills for rock and soil materials, ponds, etc., existing infrastructure and urban system
Noise pollution	Within and outside the zones (fragmentation of biological corridors)	Construction/ Operation  Long-term Permanent	By disturbing sensitive species will have a combined impact on the quality of habitats.	Landfills for rock and soil materials, ponds, etc., existing infrastructure and urban system
Light pollution	Disturbance of animals	Operation  Long-term Permanent	By disturbing sensitive species will have a combined impact on the quality of habitats.	Landfills for rock and soil materials, ponds, etc., existing infrastructure and urban system
Disruption of water balance	Destruction of food resources and suitable places for feeding/resting, nesting biotopes	Operation  Long-term Permanent, irreversible	Has combined effects of habitat destruction, drainage of wetlands and fragmentation.	Landfills for rock and soil materials, ponds, etc., existing infrastructure and urban system
Water Contamination	Within the zone	Operation  Locally, medium or long term, reversible after removing the impact	Has a combined effect with the disruption of the water balance, water contamination and habitat destruction.	Landfills for rock and soil materials, ponds, etc., existing infrastructure and urban system
Contamination of neighbouring land	Deterioration of food and breeding base of the animal species, damage to habitats	Construction/ Operation  Locally, medium or long term, reversible after removing the impact	Has a combined effect with the disruption of the water balance, water contamination and habitat destruction.	Landfills for rock and soil materials, ponds, etc., existing infrastructure and urban system
Increased risk of fires	Within the zone	Construction/ Operation  Temporary Incidental	May lead to temporary (recoverable) damage to habitats and populations.	Alternative fields, stock piles, microdam, etc. Existing infrastructure and human settlement system.
Increased risk of incidental pollution in the event of accidents within the built infrastructure	Within the zone	Operation  Temporary Incidental	May lead to temporary (recoverable) damage to habitats and populations.	Alternative fields, stock piles, microdam, etc. Existing infrastructure and human settlement system.
Influx of invasive foreign species in natural habitats	Within the zone	Construction and Operation  Long-term/ Permanent		Alternative fields, stock piles, microdam, etc. Existing infrastructure and human settlement system.



## 2.4. Planned or proposed conservation initiatives that could affect the status of the territory in the future

Proposed Nature Park "Eastern Rhodope".

## 2.5. Links between the investment proposals for gold mining with protected zones within the Natura 2000 Framework.

The investment proposal for mining and processing of gold ores from study area "Krumovgrad" falls entirely within zone BG 0001032 Eastern Rhodope (a Site of Community Importance - SCI), protected under the Habitats Directive 92/43/EEC and is located near zone BG 0002012 Krumovitsa (a Specially Protected Area - SPA), protected under the Birds Directive 79/409/EES

### 2.5.1. Likely impacts on bird species, subject to conservation in the protected zone BG 0002012 Krumovitsa.

**Table 3.** Likely impacts on birds

Elements of the IP	Potential impacts	Planning stage and impact assessment
Development of an open pit gold mine incl. and ancillary facilities – stock piles, microdam and others.	<ul style="list-style-type: none"> <li>✦ Loss or damage to nesting habitats of bird species;</li> <li>✦ Loss or damage to food/hunting habitats of bird species;</li> <li>✦ Disturbance of birds as a result of increased human presence;</li> <li>✦ Pollution with construction and municipal solid waste, including of neighbouring land.</li> </ul>	Impact assessment at this planning stage; conditions for implementing the next planning stage.
Accompanying engineering equipment - fences, soil conservation facilities, drainage facilities, water pipelines, power lines and others.	<ul style="list-style-type: none"> <li>✦ Loss or damage to nesting habitats of birds;</li> <li>✦ Loss or damage to food / hunting habitats of birds;</li> <li>✦ Damage to the landscape, reduction of the environmentally friendly options for sustainable development of protected zones (nature tourism, agricultural lands);</li> <li>✦ Disturbance of birds as a result of increased human presence;</li> <li>✦ Pollution with construction and municipal solid waste, including of neighbouring land.</li> </ul>	Impact assessment at this planning stage; conditions for implementing the next planning stage
Increased anthropogenic influence resulting from the operation of the mine and ancillary facilities	<ul style="list-style-type: none"> <li>✦ Destruction of the structure of the habitat and of the neighbouring areas as a result of the heavy machinery traffic;</li> <li>✦ Noise pollution (disturbance of birds);</li> <li>✦ Light pollution caused by lighting equipment;</li> <li>✦ Increased risk of fires;</li> <li>✦ Risk of incidental pollution in the case of accidents within the infrastructure;</li> <li>✦ Reduction of the options for sustainable development of protected zones;</li> <li>✦ Disturbance of birds as a result of increased human presence.</li> </ul>	Impact assessment at this planning stage; conditions for implementing the next planning stage.



	<ul style="list-style-type: none"><li>☛ Water and land contamination with sewerage and waste, probably generated by the landfill.</li><li>☛ Risk of incidental pollution caused by accidents within the infrastructure.</li></ul>	
Greening and reclamation activities	<ul style="list-style-type: none"><li>☛ Change in the structure and type of habitats, which makes them unsuitable for birds</li></ul>	Conditions for implementing the next planning stage



### 3. Description of the objective and goals of the protected zones and of the protected territories included therein and how they have been integrated in the development of the investment proposal, including in considering alternatives

This CA assesses the likelihood of specific impacts of the construction and operation of the investment proposal "Extraction and processing of gold ores from study area" Krumovgrad "(based on the summarized in Table 2 impact) to affect negatively the parameters for Favourable conservation status (FCS) of habitats and species. Only the direct impacts are included. In addition to the general FCS parameters, the assessment also includes the specific structures and functions, typical for the different zones. The assessments are presented in a tabular form and for the purposes of simplification the FCS parameters are not included as it has been established that they are not relevant to any of the identified impacts.

Similar species are discussed together.

#### 3.1. Zone BG0001032 "Eastern Rhodope", protected in the Habitats Directive 92/43/EEC (potential Sites of Community Importance - pSCIs)

Total area: 217352,95 ha (Anex III, Map of PZ Rhodope - Eastern)

##### **Conservation objectives and goals**

##### **Conservation goals**

- Maintain the area of natural habitats and habitats of species and their populations, subject to conservation within the PZ.
- Preserve the natural state of natural habitats and habitats of species, subject to conservation within the PZ, including the species composition, characteristic species and environmental conditions, typical for these habitats.
- When necessary, restoration of the area and the natural state of priority natural habitats and species' habitats and of the populations of species subject to protection within the protected zone.

##### **Protected species**

##### ***Habitat types included in Annex I of Directive 92/43/EEC***

The following natural habitats are subject to conservation:

3260 Water courses of plain to mountain levels with *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation

5130 *Juniperus communis* formations

5210 Arborescent matorral with *Juniperus sp.*

6110 \*Rupicolous calcareous or basophilic grasslands of the *Alyso-Sedion albi*

6210 \*Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometea*) (\*important orchid sites)

6220 \*Pseudo-steppe with grasses annuals of the *Thero-Brachypodietea*

62A0 Eastern Sub-Mediterranean dry natural grasslands (*Scorzoneratalia villosae*)

62D0 Oro-Moesian acidophilous grasslands

6510 Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*)

6520 Mountain hay meadows

8210 Calcareous rocky slope with chasmophytic vegetation

8220 Siliceous rocky slope with chasmophytic vegetation



- 8230 Siliceous rock with pioneer vegetation of the *Sedo-Scleranthion* or of the *Sedo albi-Veronicion dillenii*
- 8310 Caves not open to the public
- 9110 *Luzulo-Fagetum* beech forests
- 9130 *Asperulo-Fagetum* beech forests
- 9150 Medio-European limestone beech forests (*Cephalanthero-Fagion*)
- 9170 *Galio-Carpinetum* oak hornbeam forests
- 9180 \**Tilio-Acerion* forests of slopes, screes and ravines
- 91AA \*Eastern Pubescent Oak forests
- 91E0 \*Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)
- 91M0 Pannonian-Balkan Turkey Oak –sessile oak forests
- 91W0 Moesian beech forests
- 91Z0 Moesian silver lime woods
- 9270 Hellenic beech forest with *Abies borisi-regii*
- 92A0 Riverside galleries of *Salix alba* and *Populus alba*
- 92C0 *Platanus orientalis* woods
- 92D0 Southern riparian galleries and thickets (*Nerio-Tamaricetea* and *Securinegion tinctoriae*)
- 9530 \*Sub-Mediterranean pine forests with endemic black pines

#### **Plant types included in Annex II of Directive 92/43/EEC**

**2327 *Himantoglossum caprinum*** – found in the zone where there are many suitable habitats for the species, but primarily in places with limestone substrata since the species is a calciphyle.

#### **Invertebrates from Annex II of Directive 92/43/EEC**

Subject of conservation in PZ BG0001032 “Eastern Rhodope” are 14 species of invertebrates, three of which are priority species (indicated by a \*).

**1032 *UNIO CRASSUS RETZIUS*, 1783 (Thick Shelled River Mussel)** found in the Krumovitsa River in the area of the river 7 km above the town of Krumovgrad (Zdravko Hubenov, pers. comm.) and in the region before Krumovitsa flows into Arda River (near Potochnitsa) (Tihomir Stefanov, pers. comm.); In the protected zone it has been established in Byalata Reka River (Hubenov, pers. comm.; Bechev & Stoyanova, 2004: 21) (Annex I, Fig. 1).

**\*1093 Stone Crayfish (*AUSTROPOTAMOBIOUS TORRENTIUM*) (SCHRANK, 1803)** currently not established in the Eastern Rhodope (see Biodiversity of Bulgaria 2:, 2004).

**4053 *PARACALOPTENUS CALOPTENOIDES* (BRUNNER VON WATTENWYL, 1861)**. Locations where it has been found in the zone: Momchilgrad, Ivailovgrad, Haskovo, Krumovgrad, Dabovets, Meden Buk, Ladzha (Nedelkov, 1908; Peshev, 1975) (in Popov & Chobanov, 2004), as the nearest location to the investment proposal where it has been found is Krumovgrad (Annex I, Fig. 2).

**4045 *COENAGRION* (SÉLYS, 1850) (Damselfly)**. The nearest location to the investment proposal where it has been found is set at 30 km Northeast of Krumovgrad, near the water reservoir on the Krumovgrad – Ivailovgrad road (41° 33' N; 25° 54' E) (Marinov, 2004) (Annex I, Fig. 3).

**4032 *DIOSZEGHYANA SCHMIDTI* (DIÓSZEGHY, 1935); *Orhosia* (*Dioszeghyana*) *schmidtii***. In the Eastern Rhodope it is known from the Kenan area near Haskovo, Studen Kladenets Dam, Studen Kladenets village and Hunting Park “Kroyatsi” near Nanovitsa village (Beshkov & Langourov, 2004) (Annex I, Fig. 4).

**1074 *ERIOGASTER CATAX* (LINNAEUS, 1758)**. In the Eastern Rhodope it has been reportedly located in the area of the cave Zlatna Yama near Kremen (Djebel) village (Beshkov & Langourov, 2004) (Annex I, Fig. 5).

**1065 *EUPHYDRYAS AURINIA* (ROTTEMBURG, 1775)** Reportedly found in the Eastern Rhodope in the area of Studen Kladenets village, Dolno Cherkovishte village, Borislavtsi village, Ivaylovgrad Dam, near the village Dabovets (BESHKOV & Abadjiev 2007) (Annex I, Fig. 6).





\* **1078 CALLIMORPHA (EUPLAGIA) QUADRIPUNCTARIA** (PODA, 1761) In the Eastern Rhodope it has been located in Lebed (Djebel) village in the region of the Studen Kladenets Dam; Studen Kladenets village; Hunting Park "Kroyatsi", Nanovitsa village, Dolno Cherkovishte village; Momina Skala Lodge by the town of Madjarovo; the town of Madjarovo, Ada Tepe, in the area of Svezhest Lodge, 16.08.2005, 315 m above sea level, UTM: LF 88, GPS: N 41 ° 26'35 ", E 25 ° 39'39 ", meadows by oak forest and abandoned gardens; 9. Between Zvanarka village and Pobeda (Ovchari village), on 16.7.2007, 347 m above sea level., UTM: LF88, GPS: N41 ° 26'26 ", E25 ° 38'02", slope with herbaceous vegetation, draki (*Paliurus*), marble stones and rocks along Bjalata Reka River (Beshkov, pers. Comm.; Abadjiev & Beshkov, 2007; Beshkov & Langourov, 2004) (Annex I, Fig. 7).

**1060 LARGE COPPER (LYCAENA DISPAR) ([HAWORTH], 1802)** In the Eastern Rhodope it has been located in the region of Studen Kladenets village and then town of Lyubimets (BESHKOV & LANGOUROV, 2004) (Annex I, Fig. 8).

**1088 CERAMBYX CERDO LINNAEUS, 1758.** For now the species has not been identified in the Eastern Rhodope zone (Georgiev et al., 2004) (Annex I, Fig. 9).

**1083 LUCANUS CERVUS (LINNAEUS, 1758).** In the Eastern Rhodope it has been reportedly found in the villages Bubino and Popsko (Bechev & Stoyanova, 2004: 21)(Annex I, Fig. 10).

**1089 MORIMUS ASPER FUNEREUS (Mulsant, 1863).** In the Eastern Rhodope it has been located at the Doborsko village, Perunika village flag; Bubino village, Popsko village, Dolna Kula village (Bechev & Stoyanova, 2004: 22) (Annex I, Fig. 11) .

\* **1087 ROSALIA LONGICORN (ROSALIA ALPINA) (LINNAEUS, 1758) (ALPINE ROZALIA).** At the time of writing this species has not been reportedly located in the Eastern Rhodope (Georgiev et al., 2004) (Annex I, Fig. 12).

**4022 PROBATICUS SUBRUGOSUS (DUFTSCHMID, 1812) (WRINKLED PROBATIKUS)** The species is not located in the Eastern Rhodope..

#### **Fish from Annex II of Directive 92/43/EEC**

**1130 Asp (Aspius aspius)** Extremely rare species in the Eastern Rhodope. There is evidence it has been found in Studen Kladenets Dam (Stefanov & Trichkova, 2004).

**1137 Barbus cyclolepis (Barbus plebejus)** Endemic species for the Balkan Peninsula, spread in the basin of the Maritza River and some neighbouring rivers. In the region of Eastern Rhodope it is found in the rivers Arda, Davidkovska, Perperek, Varbitsa, Krumovitsa, Byala and Luda Rivers (Pehlivanov, 2000; Stefanov & Trichkova, 2004)

**1134 European Bitterling (Rhodeus sericeus amarus)** A rare species in the region of Eastern Rhodope, in the PZ only found in Byala Reka and Luda Reka.

**1146 Sabanejewia balcanica (Sabanejewia aurata) (Balkan loach).** Endemic species for the Balkan Peninsula. Inhabits mostly clean river sections with sandy and shingle river bed. In the protected zone found in the rivers Krumovitsa and Bjalata Reka.

#### **Reptiles from Annex II of Directive 92/43/EEC**

**1171 Balkan Crested Newt (Triturus karelinii)** A rare species to the region of Eastern Rhodope. Found in Krumovitsa River and its affluents.

**1220 European Pond Turtle; European Pond Terrapin (Emys orbicularis).** The species is found in Krumovitsa River and its affluents.

**1222 Caspian Turtle; Caspian Terrapin; Stripe-necked (Mauremys caspica).** The species is not found near area of the investment proposal.

**1279 Four-lined Rat Snake (Elaphe quatuorlineata).** A rare species to the region of Eastern Rhodope, which is not found in the area of the investment proposal.

**1193 Yellow bellied toad (Bombina variegata).** Found in Krumovitsa River and its affluents.

**1217 Hermann's Tortoise (Testudo hermanni).** The species is found in the territory of the investment proposal.

**1219 Common Tortoise; Greek Tortoise; Moorish Tortoise; (Testudo graeca)** The species is found on the territory of the investment proposal.

#### **Mammals from Annex II of the Directive 92/43/EEC**



**1302 Mehely's Horseshoe Bat (*Rhinolophus mehelyi*).** On the territory of Eastern Rhodope it is the rarest Horseshoe bat. Resident species. Inhabits mainly underground cavities, often in mixed colonies with other Horseshoe bats.

**1303 Lesser Horseshoe Bat (*Rhinolophus hipposideros*).** One of the most common types Horseshoe bats in the protected zone. Resident species, inhabits year round shallow underground shelters, also found in man-made constructions.

**1304 Greater Horseshoe Bat (*Rhinolophus ferrumequinum*).** The most frequently found Horseshoe bat in the protected zone. Inhabits over 50 percent of known bat shelters here. It has been established that in Eastern Rhodope the species forms one of the largest breeding colonies in Europe, numbering several thousand specimens (area of town Madjarovo). Resident species.

**1305 Mediterranean Horseshoe Bat (*Rhinolophus euryale*)** Found in about 20 percent of known bat shelters in the Eastern Rhodope. A typical forest dweller of karst terrain. The species is present all year round.

**1306 Blasius's Horseshoe Bat (*Rhinolophus blasii*).** Often forms mixed colonies with southern Horseshoe. The species is characteristic of the Eastern Rhodope, relatively more common here than in Western and Northern Bulgaria. The species is present all year round.

**1307 Lesser Mouse-Eared Bat (*Myotis blythii*):** a common species in low hilly and mountainous areas of the country. In the protected zone the species is rare as it inhabits mainly regions with low bushes; non-dense woods; steep, rocky river banks. In the daytime the species uses mostly underground shelters.

**1308 Western Barbastelle (*Barbastella barbastellus*):** The species is extremely rare in the protected zone. Inhabits mountainous terrains with moist, old forests.

**1310 Common Bentwing Bat or Schreiber's Long-Fingered Bat (*Miniopterus schreibersii*):** The day-time shelters of the species are underground, usually natural karst cavities. It flies over long distances (tens of kilometres) in search of food and therefore its food habitats are often far from its day-time shelter. Migratory species.

**1316 Long-fingered Bat (*Myotis capaccinii*)** The species is a characteristic fauna element of karst terrain as it dwells mainly in caves. Food is often above the rim, near wooded areas.

**1321 Geoffroy's Bat (*Myotis emarginatus*).** In the protected zone are known significant permanent breeding and winter colonies. In the area of the town of Madjarovo it breeds in abandoned mine galleries and underground facilities and its population reaches several thousand specimens.

**1323 Bechstein's Bat (*Myotis bechsteinii*).** A rare species within the protected zone. Inhabits mostly old deciduous forests. Its biology and habitat in the Eastern Rhodope is still insufficiently studied.

**1324 Greater mouse-eared bat (*Myotis myotis*).** Often inhabits caves. Hunts in non-dense forests and open meadows. Feeds mostly on large insects, which it can capture even directly from the soil surface. Forms mixed colonies with the Lesser Mouse-Eared Bat. In search of food it may travel substantial distances-tens of kilometres- from its day time shelter.

**1355 European Otter (*Lutra lutra*).** A rare species occurring in all rivers in the zone with permanent presence of water and in their affluents, when filled with water.

**1352 Grey wolf (*Canis lupus*).** The species is found throughout the Eastern Rhodope in suitable habitats - forests, mixed forests with open areas, rocky areas and others. Although distributed everywhere within the zone, the distribution of the species is with low density because of the nature of habitats and their fragmentation by anthropogenic areas.

**2635 Marbled Polecat (*Vormela peregusna* ).** The species is extremely rare throughout the country, found infrequently in the zone in some habitats.

**1354 Brown bear (*Ursus arctos*).** Single specimens have been observed in the Western border area of the zone and in the South area in high ridges. Extremely rare for the zone.

**2617 Mouse-tailed Dormouse (*Myomimus roachi*).** Extremely rare in the country: found only in Southeast Bulgaria – several points of distribution in the zone.

**1335 European Ground Squirrel/ Souslik (*Spermophilus citellus*).** Endangered species, prefers open herbaceous and steppe habitats. Extremely rare with points of distribution in the Eastern Rhodope zone.

### 3.2. Protected Area BG 00002043 "Krumovitsa" under the Birds Directive 79/409/EES (Special Protected Areas - SPAs)

#### Description



Adopted with Decision N 122 of 02.03.2007 of the Council of Ministers (promulgated in SG. issue 21 from 09.03.2007)

Total area: 111 964.20 ha (Annex IV, Map of PZ Krumovitsa)

The location includes valleys in the midstream of the Krumovitsa River and in the Dyushun Dere River together, together with the adjoining hills and slopes of the Eastern Rhodope. The site includes sections of the Krumovitsa River in the area between the village of Gorna Kula and the mouth of Dyushun Dere River and southeast from there it reaches the village of Chal. The valley of Krumovitsa River in this area is between 300 and 1000 m. wide and at places significant parts of the valley is occupied by the sandy riverbed. The river banks are in varying degrees covered with coastal wood plants, mainly poplar */Populus spp./*, willows */Salix spp./*, black alder */Alnus glutinosa/* and others. Predominant are bush plants, mainly blackberry */Rubus spp./*, hip */Rosa spp./* and others. In many places in the riverbed itself bushes, mainly tamariks */Tamarix spp./*, and herbaceous vegetation grow. At some places the banks of the Krumovitsa River are steep and rocky. There is arable land in the valley.

The valley of Dyushun Dere River is for the most part narrow and deeply carved into volcanic rocks, with many steep rocks by the river bed, waterfalls and small caves. The tree vegetation on the banks is scarce and bush species prevail.

Both rivers exhibit strong fluctuation of their flow- from very high around February-March, to almost completely dry in July and August (save for some pools). A substantial part of the area includes low ridges and slopes. For the most part there are no forests, except in the south-eastern regions where there are old deciduous forests of Hungarian Oak */Quercus frainetto/*, durmast */Quercus dalechampii/* with Mediterranean elements, at places Oriental Hornbeam */Carpinus orientalis/*, and secondary forests in place of old forests that have been clear cut in recent decades. Characteristic for the slopes and ridges of both valleys is the presence of many rocks, cliffs, as well as significant areas of bush formations of Mediterranean type, predominantly Red Juniper */Juniperus oxycedrus/* etc.. In many places there are strong rugged areas covered with grass vegetation (Bondev, 1991; Gyuleva, Petrova, 1996).

In the area of Krumovitsa have been established 136 bird species, of which 26 are included in the Red Book of Bulgaria (1985). From these 136 species, 64 are of European Environmental Significance (SPEC)(BirdLife International, 2004). As globally endangered species in category SPEC1 are included two species, as endangered in Europe in category SPEC 2 fall 18 species and in SPEC 3 - 44 species. The location is of world significance as a biome representative of the Mediterranean region. Seven species with restricted distribution, typical for this type biome of the total nine known in Bulgaria, are found in this location - Spanish Wheatear */Oenanthe hispanica/*, Olive-tree Warbler */Hippolais olivetorum/*, Red Warbler */Sylvia cantillans/*, Small Sardinian Warbler */Sylvia melanocephala/*, Rock Nuthatch */Sitta neumayer/*, Masked shrike */Lanius nubicus/* Black-headed Bunting */Emberiza melanocephala/*.

Krumovitsa is one of the few places in Bulgaria where still can be seen two threatened with extinction species - the Black Vulture */Aegypius monachus/* and Lesser Kestrel */Falco naumanni/*.

In Krumovitsa there are suitable habitats for 46 bird species listed in Annex 2 of the Bulgarian Law on Biological Diversity, which require the application of special conservation measures. Twenty-eight of these species are also listed in Annex I of Directive 79/409/EEC and more than half of these have significant nesting populations in the area. For black stork */Ciconia nigra/*, Little Eagle */Hieraetus pennatus/*, Egyptian vulture */Neophron percnopterus/* and the large Olive-tree Warbler the area of Krumovitsa is one of the most important Site of Community Importance in the country where these species nest.

## Conservation Goals

- 🌿 Protect and maintain the habitats of the endangered bird species, listed below, under art. 6 (1) (iii) Bulgarian Law on Biological Diversity during nesting and migration to achieve their FCS;
- 🌿 Improve the nesting conditions of the Lesser Kestrel in order to restore its population in the area;
- 🌿 Protect the habitats of other bird species protected under the Berne Convention;
- 🌿 Restore the natural forest habitats;
- 🌿 Conservation and maintenance of the biodiversity in the region as a prerequisite for the stability of ecosystems, ensuring the FCS and vitality of populations of protected species;
- 🌿 Restoration and maintenance of pasture livestock as a prerequisite for the maintenance of viable populations of vultures in the region;
- 🌿 Sustainable use of natural resources and sustainable development of communities, ensuring the FCS of protected species.



## Protected species

Species protected under art. 6 (1) (iii), included in Annex 2 of the Bulgarian Law on Biological Diversity Act:

Black Stork */Ciconia nigra/*, Honey Buzzard */Pernis apivorus/*, Black Kite */Milvus migrans/*, Egyptian Vulture */Neophron percnopterus/*, Eurasian Griffon Vulture */Gyps fulvus/*, Eurasian Black Vulture */Aegypius monachus/*, Short-toed Eagle */Circaetus gallicus/*, Levant Sparrowhawk */Accipiter brevipes/*, Long-legged Buzzard */Buteo rufinus/*, Golden Eagle */Aquila chrysaetos/*, Booted Eagle */Hieraetus pennatus/*, Lesser Kestrel */Falco naumanni/*, Eurasian Stone-curlew */Burhinus oedicnemus/*, Eurasian Eagle Owl */Bubo bubo/*, Nightjar */Caprimulgus europaeus/*, Common Kingfisher */Alcedo atthis/*, European Roller */Coracias garrulus/*, Grey-headed Woodpecker */Picus canus/*, Black Woodpecker */Dryocopus martius/*, Syrian Woodpecker */Dendrocopos syriacus/*, Middle Spotted Woodpecker */Dendrocopos medius/*, Calandra Lark */Melanocorypha calandra/*, Greater Short-toed Lark */Calandrella brachydactyla/*, Woodlark */Lullula arborea/*, Tawny Pipit */Anthus campestris/*, Black-eared Wheatear */Oenanthe hispanica/*, Olive-tree Warbler */Hippolais olivetorum/*, Subalpine Warbler */Sylvia cantillans/*, Sardinian Warbler */Sylvia melanocephala/*, Barred Warbler */Sylvia nisoria/*, Western Rock Nuthatch */Sitta neumayer/*, Red-backed Shrike */Lanius collurio/*, Lesser Grey Shrike */Lanius minor/*, Masked Shrike */Lanius nubicus/*, Ortolan Bunting */Emberiza hortulana/*.

Other species:

Black headed Bunting */Emberiza melanocephala/*.

### 3.3. Description of the territory of the proposal and the alternative sites

From a botanic-geographic perspective, the investment proposal and the alternative fields fall into the European deciduous forest area, Macedonian-Thracian Province, East Rhodope Region, Krumovgrad Area. The indigenous vegetation consists of xerotherm mixed oak (Turkey oak, Hungarian oak, durmast, hornbeam) forests. Only at the highest parts (by the Bulgarian-Greek border) dominate thermophilic beech forests. In many places indigenous oak forests are replaced by secondary coenosis of Oriental hornbeam and occupy large areas of complex coenosis of Red Juniper combined with pasture communities. The high degree of anthropogenic degradation leads to strong fragmentation of natural communities (grass, bushes and trees) and their ruderalisation. The active grazing (especially in the recent past) and the strong Mediterranean influence are the reason for the presence of many annual species (therophytes) incl. cereal grasses (*Poa bulbosa*, *Psilurus aristatus*, *Brachypodium distachion*) in the composition of pasture coenosis.

The investment proposal covers an area of about 85 hectares, including the hill Ada Tepe and neighbouring areas, where the construction of stockpiles, water pipes, landfills for ore materials is planned.

The area of the main investment proposal and consequently the subject of this CA is the Ada Tepe area. The hill Ada Tepe is 492.4 meters high and dominates the landscape. Its primary vegetation consists of xerotherm oak forests and remains thereof may be found as individual trees or tree groups. This vegetation has been destroyed in the past and the hill was almost completely deforested. About 40-50 years ago black pine (*Pinus nigra*) and locust tree (*Robinia pseudoacacia*) were planted, which develop relatively well and now occupy most of the area. In some areas restoration of the natural tree and bush vegetation can be observed. These processes cannot be substantially activated in the future due to a change in the soil reaction caused by the pine monoculture, which make the full restoration of the autochthonous vegetation of Ada Tepe impossible. Southern and Eastern slopes of the hills are steep and were used as pasture in the past. A better development of grass vegetation is observed there. Of national importance for conservation and especially characteristic of the area are the petrophile coenosis, which represent habitat "Thracian ling", on the slopes of Ada Tepe, north of the merge of the Kesebir River into Krumovitsa River. *Cistus incanus*, *Koeleriasplendens*, *Hypericum olympicum* and others prevail. The habitat is included in Volume 3. Natural Habitats of Bulgaria's Red Book. The lower Southern slopes of Ada Tepe are highly ruderalised pastures, mixed with diluted coenosis of Oriental Hornbeam (*Carpinus orientalis*), which occupy a relatively small area.

The gully (Kaldzhik Gully), where Alternative 2 intends to construct pond, is located northwest of Ada Tepe, next to the Western slopes of the mountain, where black pine cultures are found. The gully bed is partially developed, there is some arable land. Its northern banks constitute a low ridge, which is occupied by a complex coenosis of pseudo steppe of annual grains (*Poa bulbosa*, *Psilurus aristatus*, *Brachypodium distachyon* and others.) - Habitat 6220 \* and Red Juniper scrubs (*Juniperus oxycedrus*) - Habitat 5210. There are also some preserved small and highly ruderalised fragments of mesophilic hey meadow-Habitat 6510. Despite the high degree of anthropogenic degradation due to active in the past grazing; relatively stable populations of orchids of the *Ophrys* genus can be found. In the wall of tailing pond there is preserved stand of oak (*Quercus daleschampi*). Alternative 1 does not affect Kaldzhik dere.



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On the East and North sides of Ada Tepe pass the Kesebir and Krumovitsa rivers, which merge southeast of the hill. They are characterised by spring freshet. In summer large shingle deposits become exposed. Downstream there are small but relatively well represented riparian scrubs with *Tamarix ramosissima*, also a habitat included in the Habitats Directive - 92D0.

The remaining terrain on which the investment proposal is planned to be developed, are mainly cultivated areas heavily ruderalised semi-rural areas and human settlements (hamlets), in which there are no permanent residents.

### **3.4. Protected areas and areas of international conservation status and their relationship with the protected zones**

There are no such areas in the territory of the investment proposal.



## 4. Assessment of the likelihood and degree of impact on the objectives and goals of the protected zones

### 4.1. General assessment of the likely impacts of the proposal on individual habitats and species, subject to conservation in the affected protected areas

Based on the summarized impacts, the likelihood of certain effects of the IP to negatively affect the FCS parameters of habitats and species, subject to conservation in the protected zones, has been evaluated. In the assessment, apart from the general FCS parameters, the specific structures and functions, typical for different zones, have been added. The results are presented in a tabular form and for the sake of clarity, the FCS parameters are not included since it has been established that they are not relevant to any of the identified impacts. Similar species are discussed under one heading.

The evaluation serves to identify impacts that need to be assessed for each species in every affected zone with respect to their degree of impact. The threshold values of each cited FCS parameter in the different zones are listed in the FCS tables.

#### 4.1.1. Habitats, subject to conservation in the protected zones and the likely impact on them in the construction and operation of the investment proposal "Extraction and processing of gold ores from study area "Krumovgrad"

Relatively small area (about 81 hectares) or about 0.037 per cent of the area of the zone that will be affected and the proximity to anthropogenic landscape (many villages and fields, actively used pastures, forests) explain the relatively small number of habitats and species that will be affected by the investment proposal.

#### 5210 Arborescent matorral with *Juniperus sp*

This habitat occupies about 6,520 hectares or 3 percent of the total area of the zone. In the area of investment proposal the habitat is represented only in few areas. In this sense, the communities of Red Juniper on the slope of the mining waste landfill have a local significance.

A small area (3-4 acres) and returns to the junipers habitat at the site of declined forest stands. The community is not a typical species composition and ecological structure. Habitat will be affected directly by the investment proposal. Probably an indirect impact may have caused by anthropogenic presence and possible air pollution. In alternative 2 will be destroyed about 130 acres or 0,19 % of the area of habitat in the protected zone.

**Table 4.**

Parameters Impacts	Total area	Species composition	Invasive species
<b>Direct destruction of habitat</b>	No impact	Insignificant indirect impact	Probably insignificant impact
<b>Land borders (ecotone) of habitat</b>	Insignificant indirect impact to 300 m buffer	Insignificant indirect impact	Insignificant indirect impact
<b>Fragmentation</b>	No impact on zone and local level	No impact on zone and local level	No impact on zone and local level



<b>Presence of pollutants (importers of biological contaminants)</b>	Possible insignificant impact on adjacent areas of habitat likely air pollution	Possible insignificant impact on adjacent areas of habitat likely air pollution	Possible insignificant impact on adjacent areas of habitat likely air pollution
<b>Risk of incidental pollution caused by accidents</b>	Cannot be expected impact on adjacent areas covered by habitat	Cannot be expected impact on adjacent areas covered by habitat	Cannot be expected impact on adjacent areas covered by habitat

### 6220 \*Pseudo-steppe with grasses annuals of the Thero-Brachypodietea

The total area it occupies is about 3 % of the zone or 6,520 hectares. Often forms complex communities with the coenosi of the Red Juniper, as is the case in the area of the investment proposal. This habitat is represented only in small parts in the area of the investment proposal. The primary impact on the habitat will occur in the performance of the IP in its part of small ponds in alternative 2. Even slight losses should be accounted for since this is a priority habitat.

In alternative 2 will be destroyed about 484 dka or 0,74 % of the area of habitat in the zone.

**Table 5.**

<b>Parameters Impacts</b>	<b>Total area</b>	<b>Species composition</b>	<b>Invasive species</b>
<b>Direct destruction of habitat</b>	No likely impact on alternative 1 There is probably insignificant impact (0,005 %) in alternative 2	There is likely insignificant indirect impact as a result of enhanced human attendance	No likely impact
<b>Land borders (ecotone) of habitat</b>	There is a relatively high impact at local level. Ecotone will be lost at around 450 meters in alternative 2.	There is an impact at later stages, since the preserved parts of the habitat will border onto water and the basic ecological characteristics of the environment will be changed.	There is likely insignificant impact.
<b>Fragmentation</b>	No likely impact	No likely impact	No likely impact
<b>Presence of pollutants (importers of biological contaminants)</b>	No likely impact	No likely impact	No likely impact
<b>Risk of incidental pollution caused by accidents</b>	No likely impact	No likely impact	No likely impact

### 91M0 Pannonian-Balkan Turkey oak –sessile oak forests

This habitat is one of the main habitats protected within the Eastern Rhodope Protected Zone. It combines a variety of oak forests, with Mediterranean flora elements, which cover about 31 percent of the area of the PZ (66,901 hectares). The area of the investment proposal includes several small and fragmented groves, some of which are on the Ada Tepe hill and have formed as a result of natural recovery of Black Pine. But most are found on the lower hills around Ada Tepe, one of them is by the facility for mining waste (99 dka) and the mine. Another smaller part (2dka) will be destroyed by construction of microdams – alternative 2. The investment proposal will not have a significant impact on these forests even at the local level, because North of the investment proposal there are large areas of this habitat. At the level of the protected zone the impact will be even less insignificant - 0.014 %

**Table 6.**

Parameters	Total area	Species composition	Invasive species
<b>Impacts</b>			
<b>Direct destruction of habitat</b>	A negligible impact associated with a loss of 0.014 % of the area within the protected zone and an insignificant impact at local level	Insignificant, mainly indirect, impact at the local level caused by change in some basic parameters of the environment, e.g. increased humidity and accumulation of chemical compounds	Insignificant, mainly indirect, impact at the local level caused by change in some basic parameters of the environment e.g. increased humidity.
<b>Borders (ecotone) of habitat</b>	An insignificant impact associated with a loss of about 400-500 meters from the area of the protected zone and an insignificant impact on local level	There is negligible impact	There is a likely impact
<b>Fragmentation</b>	There is small impact at local level and virtually no impact at the protected zone level, since most large forests are fragmented and are outside the area of investment proposal.	No likely impact	No likely impact
<b>Presence of pollutants (importers of biological contaminants)</b>	No likely impact	There is a likely impact	There is a likely impact
<b>Risk of incidental pollution caused by accidents</b>	There is a likely but insignificant impact on a limited area.	There is a likely impact	There is a likely impact

### 92D0 Southern riparian galleries and thickets (*Nerio-Tamaricetea* and *Securinegion tinctoriae*)

For the protection of this habitat the Eastern Rhodope zone is crucial since the habitat is protected in very few zones and the most representative of them is Eastern Redoes. The habitat covers in total about 50 ha. The largest habitat areas are along the rivers Arda, Krumovitsa, Varbitsa, Byalata Reka, etc.. Within the area of the investment proposal, the habitat covers only about 0.3 - 0.4 ha. Relatively more representative are the conenoses in the merger of the Krumovitsa River and Kesebir River.

**Table 7.**

Parameters	Total area	Species composition	Invasive species
<b>Impacts</b>			
<b>Direct destruction of habitat</b>	There is no risk of direct destruction of habitat; indirect effects due to changes in the hydrologic regime of the habitat are possible (water pit – alternative 1)	There is a likely but indirect and insignificant impact caused by changes in the hydrologic regime of rivers.	There is a likely but indirect and insignificant impact caused by changes in the hydrologic regime of rivers
<b>Borders (ecotone) of habitat</b>	Negligible impact on local level due to the increased level of urbanization of the landscape.	There is an insignificant impact on local level	There is a likely but insignificant impact on local level
<b>Fragmentation</b>	No likely impact due to strong primary fragmentation of the habitat.	No likely impact	No likely impact
<b>Presence of pollutants (importers of biological contaminants)</b>	There is a likely impact at local level	There is a likely impact	There is a likely but negligible impact





<b>Risk of incidental pollution caused by accidents</b>	There is a potential impact on very limited area. It can be presumed that this impact will be short-term, while pollution is moving in river artery.	There is a likely impact.	There is a likely impact
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### 6510 Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*)

The habitat that occupies about 0.023 % of the area or about 50 hectares. Within the area of the investment proposal there are fragments that have some characteristics of the habitat, but are highly ruderalised and have untypical species composition and are only considered as part of the habitat, subject to some qualifications. This habitat will have some impact in case of accomplishment of alternative 2. This is important impact because this could destroy 4,2 % of the habitat in the zone. Alternative 1 of IP will not have any impact on the habitat.

Moreover, such meadows are typical for more humid continental climate, whereas the area of Krumovgrad has expressed Mediterranean influence. Some of it will be flooded by microdam (21 dka). This will have significant impact because will be destroyed 4,2 % of the habitat in the zone. The increase in groundwater around the pond may be will be beneficial to the rest of the habitat, as it will create good conditions for growth of typical meadow.

**Table 8.**

Parameters	Total area	Species composition	Invasive species
<b>Impacts</b>			
<b>Direct destruction of habitat</b>	No likely impact due to alternative 1	No likely impact	No likely impact
<b>Land borders (ecotone) of habitat</b>	No likely impact due to alternative 1	There is a likely insignificant impact on local level	There is a likely insignificant impact on local level
<b>Fragmentation</b>	No likely impact	No likely impact	No likely impact
<b>Presence of pollutants (importers of biological contaminants)</b>	No likely impact	No likely impact	No likely impact
<b>Risk of incidental pollution caused by accidents</b>	No likely impact	No likely impact	No likely impact

**3260 Plain or mountain streams with *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence.

**5130 *Juniperus communis* formations on heaths or calcareous grasslands** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence.

**6110\* Rupicolous calcareous or basophilic grasslands of the *Alyso-Sedion albi*** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence. In the region there are no petrophile steppes on limestone, because most of the region is not karst.

**6210\* Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometea*) (\*important orchid sites)** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence.

**62A0 Eastern Sub-Mediterranean dry natural grasslands (*Scorzoneratalia villosae*)** – the habitat will not be affected by the investment proposal because it is not located near or in its area of influence.

**62D0 Oro-Moesian acidophilous grasslands**– the habitat will not be affected by the investment proposal because it is not located near or in its area of influence. The area of the investment proposal is located at low altitude.



**6520 Mountain hay meadows** – the habitat will not be affected by the investment proposal because it is not located near or in its area of influence. The area of the investment proposal is at low altitude, where this habitat does not exist.

**8210 Calcareous rocky slope with chasmophytic vegetation** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence. Close to the territory of the investment proposal there are no karst rock formations.

**8220 Siliceous rocky slope with chasmophytic vegetation** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence.

**8230 Siliceous rock with pioneer vegetation of the *Sedo-Scleranthion* or of the *Sedo albi-Veronicion dillenii*** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence.

**8310 Caves not open to the public** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence.

**9110 *Luzulo-Fagetum* beech forests** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence. The area of the investment proposal is at a low altitude, where these beech forests do not exist.

**9130 *Asperulo-Fagetum* beech forest** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence. The area of the investment proposal is at a low altitude, where these beech forests do not exist.

**9150 Medio-European limestone beech forests of the *Cephalanthero-Fagion*** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence.

**9170 *Galio-Carpinetum* oak hornbeam forests** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence.

**9180\* *Tilio-Acerion* forests of slopes, screes and ravines** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence. This habitat occurs mainly at higher altitudes than the location of the investment proposal.

**91AA \* Eastern forest of shaggy oak** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence.

**91E0\* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence.

**91W0 Moesian beech forest** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence.

**91Z0 Moesian silver lime forest** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence.

**9270 Hellenic beech forests with *Abies borisii-regis*** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence. This habitat occurs mainly at higher altitudes than that of the investment proposal.

**92A0 Riparian galleries of *Salix alba* and *Populus alba*** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence.

**92C0 forests of *Platanus orientalis*** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence. This habitat occurs mainly at higher altitudes than that of the investment proposal.

**9530\* Sub-Mediterranean pine forests with endemic subspecies of black pine** – the habitat will not be affected by the investment proposal because it is not located near or within its area of influence. This habitat occurs mainly at higher altitudes than that of the investment proposal.

#### **4.1.2. Plant species subject to conservation in the protected zones and expected impact on them in the construction and operation of the facility**

**2327 Orchid (*Himantoglossum caprinum*)** - The species was not established on the territory of the investment proposal. Its habitats are mainly diluted forests and pastures in xerotherm karst heights. It is believed that in the area of the investment proposal there are no suitable habitats for the species, since there is virtually no natural forest vegetation on limestone soils.



## 4.2. Assessment the impact of implementation of the investment proposal, including the development of the alternative fields, on habitats.

The assessment of the degree of the impact of the investment proposal for the construction of an open pit mine and possible alternative variants on the protected zones is based on the impact on every FCS criterion - population in the zone, area covered by the habitats in the zone (whereas specific small but significant habitats are considered separately), the quality of the habitat (structural and functional parameters), future prospects (other important parameters). Separately are accounted for other structural and functional parameters, such as the overall functional role of zone for the linkage of the Natura 2000 Network – biological corridor function, geographic linkage. The characteristics of each type of impact are addressed in Chapter 2.

To determine the extent of the impact, an assessment scale from 1 to 10 is used, which allows to account for various parameters of an impact's significance in accordance with standard indicators for assessing the degree of impact.

**Table 9. Matrix for assessing the degree of impact**

ASSESSMENT	CRITERIA
0	The activity has no impact.
1	The activity has a negligible negative impact.
2	The activity may have temporary adverse effects.
3	The activity may have short-term negative impacts.
4	The activity may have negative secondary effects.
5	The activity may have cumulative negative effects.
6	The activity may have synergistic effects.
7	The activity may have secondary, cumulative, synergistic negative impact. The impact can be eliminated through mitigation/compensatory measures.
8	The activity may have significant secondary, cumulative, synergistic negative impact. The impact can be eliminated through mitigation/compensatory measures.
9	The activity has a significant medium- or short-term/permanent negative impact. The impact can be eliminated through mitigation/compensatory measures.
10	The activity has a significant and permanent/irreversible negative impact. The impact can not be removed through mitigation/compensatory measures.

### Assessment

**0 =** no impact

**1 to 3 -** low impact, which can be avoided without special measures other than compliance with best practices for construction and operation;

**4 to 6 -** average level impact, which should be considered in combination with other factors; measures for its reduction or elimination should be recommended;

**7 to 10 -** significant impact, which must be removed by replacing the planned activities with alternatives, or by applying of mitigation and compensatory measures.

### 5210 Arborescent matorral with *Juniperus sp.*

Operation of the mine and surrounding infrastructure will be indirectly affected around 300 meters from the boundaries of the habitat area. The impact will mainly consist of modifying the environmental characteristics of the environment, which may lead to a change in species composition. And on local level this loss can be characterized as insignificant.

local

**Table 10.**

Parameters Impacts	Total area	Species composition	Invasive species



<b>Zero alternative</b>	0	0	0
<b>Investment proposal – Alternative 1</b>	0	2	2
<b>Investment proposal – Alternative 2</b>	5	5	5

### 6220 \*Pseudo-steppe with grasses annuals of the *Thero-Brachypodietea*

In the operation of the mine and the accompanying infrastructure approximately 0.005 % of the habitat's area in the PZ will be affected. The impact will be in the form of loss of ecotone and change in the ecological characteristics of the environment that will lead to a change in the species composition.

**Table 11.**

<b>Parameters Impacts</b>	<b>Total area</b>	<b>Species composition</b>	<b>Invasive species</b>
<b>Zero alternative</b>	0	0	0
<b>Investment proposal – Alternative 1</b>	1	1	1
<b>Investment proposal – Alternative 2</b>	1	1	1

### 91M0 Pannonian-Balkan Turkey oak –sessile oak forests

In the operation of the mine and the accompanying infrastructure approximately 0.014 % of the habitat's area in the PZ will be affected. The impact at local level can also be described as negligible. For this habitat, the implementation of both options is irrelevant because the impact on it is negligible.

**Table 12.**

<b>Parameters Impacts</b>	<b>Total area</b>	<b>Species composition</b>	<b>Invasive species</b>
<b>Zero alternative</b>	0	0	0
<b>Investment proposal – Alternative 1</b>	1	1	1
<b>Investment proposal – Alternative 2</b>	1	1	1

### 92D0 Southern riparian galleries and thickets (*Nerio-Tamaricetea* and *Securinegion tinctoriae*)

In the operation of the mine and the accompanying infrastructure (both alternatives), loss of area or long-term negative impact on the habitat are not expected. Direct insignificant impact at zone and local level can be expected from construction and operation of water pit (alternative 1) on shore of Krumovitsa river. Short-term indirect effects, such as the risks of accidents and incidental pollution of rivers or changes in the hydrological regime due to increased water use, are possible.

**Table 13.**

<b>Parameters Impacts</b>	<b>Total area</b>	<b>Species composition</b>	<b>Invasive species</b>
<b>Zero alternative</b>	0	0	0
<b>Investment proposal – Alternative 1</b>	0	3	3
<b>Investment proposal – Alternative 2</b>	3	5	5



### 6510 Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*)

Operation of the mine and surrounding infrastructure in alternative 1 is not expected loss of habitats and long-term negative impact on that habitat.

**Table 14.**

Parameters Impacts	Total area	Species composition	Invasive species
Zero alternative	0	0	0
Investment proposal – Alternative 1	0	2	2
Investment proposal – Alternative 2	0	0	0

#### 4.2.1. Conclusions on the expected impact of the investment proposal "Extraction and processing of gold ores study area" Krumovgrad" on habitats

In the operation of the gold mine in study area "Krumovgrad", the following negative impacts on species and habitats are possible:

- ✦ Direct destruction of habitat during construction - a negligible impact on both the protected zone and local levels for Habitat 91M0 (alternative 2)
- ✦ Indirect insignificant impact on habitats 5210, 6220, 6510, 91M0 and 92D0.
- ✦ Influx of invasive plant species and change in the species structure of the habitats, mainly due to the increased urbanization in this part of the PZ.
- ✦ Cannot be detect direct or indirect impact on the rest habitats

Expected impact in national level is insignificant on habitats 5210; 6510; 6220; 91M0 и 92D0 да е незначително.

#### 4.3. Assessment of the impacts of IP's implementation and in the implementation of alternative sites on invertebrates.

##### **1032 UNIO CRASSUS RETZIUS, 1783 (Thick Shelled River Mussel)**

In the sections of the Krumovitsa River bordering onto the territory of investment proposal no live specimens, or their shells, were found. However, populations of *Unio crassus* occurring in Krumovitsa River further downstream (above the town of Krumovgrad and in the section before it flows into Arda River (near Potochnitsa village)) are directly threatened in the event of cyanide compounds, biological contaminants and pulp enter the waters of the river in the event of road. This is so *Unio crassus* is one of the most pollution sensitive species and water eutrophication. Furthermore, the destruction of the ichthyofauna indirectly prevents its ability to develop and reproduce (its larvae lead parasitic life on the skin and gills of freshwater fish).

Populations of *Unio crassus* are distributed unevenly in the river areas and currently three populations in the protected zone have been identified (Hubenov, pers. comm.; Stefanov, pers. comm.; Bechev & Stoyanova, 2004).When the IP implementation of is not expected to seriously impact on population and habitats. Moreover, the section of Krumovitsa river down to Krumovgrad town and area of IP drying up for a long period of time, which is natural barrier that stops rapid spreading of chemical compounds along the river.

In this case impact on habitats and populations of *Unio crassus* may have only on road accidents and/or uncontrolled discharges of turnover water into Krumovitsa river that contains water with concentration of chemical compounds above the standards. But overall implementation of IP will not negatively affect the parameters of the favourable conservation of species (FCS).

**Table 15.** Assessment of the probability and the level of impact on the FCS parameters for *Unio crassus* within the protected zone

Alternatives	Zero alternative	Alternatives 1	Alternative 2



Impacts			
<b>Direct destruction and damaging of habitats (total area)</b>	No impact	Overall implementation of IP will not negatively affect the parameters of the favourable conservation of species (FCS).	There is possible impact on local level and zone level in case of transport accidents or/and uncontrolled flow out of waste water with high concentration in the river and cumulative effect.
<b>Deterioration of the qualities of habitats (structure and function)</b>	No impact	There is likely impact on local level only in cases of road accidents and/or often uncontrolled discharges to the Krumovitsa river of turnover water with high concentration of chemical reagents used in the process.	There is possible impact on local level and zone level in case of transport accidents or/and uncontrolled flow out of waste water with high concentration in the river. Consequently, will be accumulated unusual chemical compounds, which can lead to eutrophication of waters and charges in diet of Unio.  Likely cumulative effect by melioration activities and getting into groundwater with accumulated in them fertilizers and insecticides.
<b>Reducing the size of the population (number of fields)</b>	No impact	Implementation of the IP will not have impact on parameters of FSC of the species.	In case of incidental contamination of Krumovitsa River, there is a highly probable deterioration of the quality of the habitat.
<b>Mortality of specimen</b>	No impact	Implementation of the IP will not have impact on parameters of FSC of htr species	There is a likely impact in case of incidental contamination of Krumovitsa River with chemical compounds
<b>Risk of contamination during accidents in the built infrastructure (worst case scenario)</b>	No impact	There is impact at accident place.	There is possible impact along the river. Could be affected 33 % of the population in the zone.
<b>Invasion of foreign species in the natural habitats</b>	No impact	No Impact	There is possibility for small impact which is indirect in case of substitution of fish fauna.

**\* 1093 AUSTROPOTAMOBIVUS TORRENTIUM (Schrank, 1803) (Stone Crayfish)**

The species is not currently established in the Eastern Rhodope (see Biodiversity of Bulgaria 2:, 2004), respectively it has not been found on the territory of the IP.

**4053 PARACALOPTENUS CALOPTENOIDES (BRUNNER VON WATTENWYL, 1861)**

The species is not established in the territory of the IP and its habitat does not fall within the scope of the IP or its area of influence (Annex I, Fig. 2).

**4045 COENAGRION ORNATUM (SÉLYS, 1850)**

The species is not established in territory of the IP and its habitat does not fall within the scope of the investment plan or its area of influence (Annex I, Fig. 3).

**4032 DIOSZEGHYANA SCHMIDTI (Diószeghy, 1935)**

The species is not established in the territory of the IP and its habitat does not fall within the scope of the investment plan or its area of influence (Annex I, Fig. 4).

**1074 ERIOGASTER CATAX (LINNAEUS, 1758)**



The species is not established in the territory of the IP and its habitat does not fall within the scope of the investment plan or its area of influence (Annex I, Fig. 5).

**1065 EUPHYDRYAS AURINIA (ROTTEMBURG, 1775) (Marsh Fritillary)**

The species is not established in the territory of the IP and its habitat does not fall within the scope of the investment plan or its area of influence (Annex I, Fig. 6).

**\* 1078 CALLIMORPHA (EUPLAGIA) QUADRIPUNCTARIA (PODA, 1761)**

In these survey, this species was not found, which is probably due to the combined effect of dependence of its regime dynamics to the weather conditions and due to the relatively short survey period. During more than ten years of lepidopterologic research in Eastern Rhodope by Dr. Stoyan Beshkov, the presence in the IP area of a relatively small population of *Callimorpha (Euplagia) quadripunctaria* was established (see Chapter 5, Abadjiev & Beshkov, 2007). Here is situated one of five known populations of the species in Eastern Rhodope and one of the four populations in the protected zone (Annex I, Fig. 7), which makes this population extremely important due to its key role for supporting the genetic exchange between the populations within the zone and outside the zone with other protected zones. Moreover, the fifth, the farthest West located population of *Callimorpha (Euplagia) quadripunctaria* in Eastern Rhodope is situated in the region of Dzhebel outside the protected zone, therefore it is difficult control its conservational status.

For the purpose of this evaluation were carried out two field surveys in 2008 and 2010. In the survey in July 2010 showed the existence of food sources for the larvae, open areas with flowering herbaceous plants that provide food for the imago. To establish the species in the zone were used 2 standard methods – attracting with artificial light at night and direct observation and capture the individuals active during the day. Light traps were exposed on 03.08 – 05.08.2010 during all night. Captured individuals were released after recording the species identity and number. Identified individuals in these habitats prove the existence of a local population of *Euplagia quadripunctaria* in the territory of IP.

So far in Bulgaria there have been no population studies on both *Euplagia quadripunctaria*, and on butterflies in general. It is therefore difficult to interpret any numeric data. In assessing the population and impact on it was used practice for determining the FCS of the species in some Natura 2000 areas. When specimen is located in the range of Land Cover polygon it is considered that whole polygon is habitat for the species and hence there is local population. The impact is calculated by covered area – the area of IP is calculated as percentage of local population and whole population in the zone Eastern Rhodope.

In terms of local impact of IP (alternative 1) a significant part of the habitat of the species, respectively the local population will be destroyed – 23,46 % (calculated on the basis of outer boundaries of the IP, pink polygons on the map; total area of 134 ha). Perhaps the damaged area will be slightly smaller (yellow rectangles and polygons in the pink polygon, an area of 83 ha). Overall, the local impact would be significant not long lasting. It is possible to be reversible after proper reclamation activities.

When making interception between two layers (affect area and area of the population) on zone level was found that the impact will be on 0,56 % of the total area of the population (calculated on area of IP – 134 ha). According to the matrix for FCS the species in order to be in FCS the population should be constantly or increasing and not less than 99 % of the reference population of the area. According to the impact of actual IP (Alternative 1) would affect less than 1 % of the population and can be defined as poor. Although the impact will not lead to passafe of the species in unfavourable conservation status in the protected zone.

**The IP "Extraction and Processing of Gold-Bearing Ore from the Krumovgrad Exploration Area" will have impact to the habitat and the local population of the *Euplagia quadripunctaria*. The impact in zone level will be below 1 % and will not lead to passage the species in an unfavourable conservation status, if no other IPs, which would increase the impact. At national level impact is negligible.**

Should be noted that the finally impact of this IP on zone level is necessary to be considered other IP, which would lead to negative effect on the population of *Euplagia quadripunctaria*. So far we don't have such data for other IP I we can't predict those impacts.

**Table 16.** Assessment of the likelihood and degree of impact on the FCS parameters for *Callimorpha (Euplagia) quadripunctaria* within the scope of the protected zone

Alternatives	Zero alternative	Alternative 1	Alternative 2
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Impacts			
<b>Direct destruction and damaging of habitats (total area)</b>	No impact	Can be expected permanent impact on local level during construction and operation of the elements of IP following: generating dust and gas emissions and energetic pollutants (noise and vibration), excavation and disposal activities of ore and rock mass; movement of vehicles and strong anthropogenic presence.	Can be expected permanent impact on local level during construction and operation of the elements of IP following: generating dust and gas emissions and energetic pollutants (noise and vibration), excavation and disposal activities of ore and rock mass; movement of vehicles and strong anthropogenic presence.
<b>Deterioration of the qualities of habitats (structure and function)</b>	No impact	The activity will cause impact on habitats of the species.	The activity will cause impact on habitats of the species.
<b>Reducing the size of the population (number of fields)</b>	No impact	There are likely impact in relation to violations of spatial and age class structure of the population and quality of places for feeding, copulation and, growth and rest of this priority species.	There are likely impact in relation to violations of spatial and age class structure of the population and quality of places for feeding, copulation and, growth and rest of this priority species.
<b>Mortality of specimen</b>	No impact	There are probably a strong impact resulting from the destruction and/or contamination of the feed base and soils on which the larvae growth  Imago is highly vulnerable to the availability of light and noise pollution, explosive activities, permanent traffic and anthropogenic presence.	here are probably a strong impact resulting from the destruction and/or contamination of the feed base and soils on which the larvae growth  Imago is highly vulnerable to the availability of light and noise pollution, explosive activities, permanent traffic and anthropogenic presence.

### **1060 LYCAENA DISPAR ([HAWORTH], 1802)**

The species has not been identified in the area of the investment proposal. The habitat does not fall within the scope of the IP or in its area of influence (Annex I, Fig. 8).

### **1088 CERAMBYX CERDO LINNAEUS, 1758 (BIG SECHKO USUALLY SECHKO)**

In the area of investment proposal has been identified one male *Cerambyx cerdo* (in the area above Svehest Lodge, 12. VII .2008 year). The adult and its larvae are directly linked to deciduous forest habitats, where they develop very slowly. There adults hide and feed on tree juices, and the larvae grow in the trunks of rotting, ill or dead deciduous trees (mainly oak and less frequently, other deciduous species), but sometimes develop in young trees or in stumps. Therefore, they will be entirely dependent on the presence of such substrates in the IP area and the impact on their habitats will be a major limiting factor for the species in the region and in the PZ. The bugs fly in the evening or early hours of the night when they feed, copulate and lay eggs in cracks of the bark of trees. This makes them vulnerable to the presence of dust, noise and light pollution in their habitat (deterioration in the quality of their food base; disturbance and disorientation, increase in mortality caused by increased traffic). Not without significance is the increased risk of fires and accidents in the area of the investment proposal.

In the region the feeding and development of *Cerambyx cerdo* are directly linked to one of the main habitats in protected zone, namely 91 M0 91M0 Pannonian-Balkan Turkey Oak –sessile oak forests, which cover about 31 percent of the PZ or around 66,901 hectares. In the area of investment proposal the habitat covers several small and fragmented groves, some of which are on Ada Tepe and have formed due to natural restoration of black pine crops or are in found the area around the hill. According to the expert opinion of the botanists involved in the CA, the development and operation of the investment proposal will not have a significant impact on these forests (and on others, including beech





and hornbeam) even at the local level, because North from the IP area are found large areas of these forests. The influence on them at the local and at the zone levels is defined as insignificant.

The impact assessment (Table 17, Annex II, Fig. 4-5) shows that in the implementation of the investment proposal in both alternatives the impact on the species' habitat will be insignificant - between 0,01 % and 0.03 %, and on local level 7,3 % (Alternative 1) and 11, 64 % (Alternative 2).

The local impact can be completely avoided (limited to 1%) by the package of mitigation measures and activities and mainly through reduction of the area of natural habitat 91 M0 Pannonian-Balkan Turkey Oak – sessile oak forests affected by the stock pile for low-grade ore (Annex II, Figure. 6). The assessment of the impact on other FCS parameters for the species shows that the implementation of the investment proposal will not have a substantial negative impact on the species and in the Alternative Version of the IP, the impact is weakest and almost avoided by the implementation the package of mitigation measures and activities.

**Table 17.** Assessment of the likelihood and degree of impact on the FCS parameters for *Cerambyx cerdo* within the scope of the protected zone

Alternatives / Impacts	Zero alternative	Alternative 1	Alternative 2
<b>Direct destruction and damaging of habitats (total area)</b>	No impact	The impact assessment (Table 17, Annex II, Fig. 4-5) shows that in the implementation of the investment proposal will have negligible impact between – 0,01 to 0,03 %.  The local impact can be completely avoided (limited to 1%) by the package of mitigation measures and activities and mainly through reduction of the area of natural habitat 91 M0 Pannonian-Balkan Turkey Oak –sessile oak forests affected by the stock pile for mine waste.	The impact assessment (Table 17, Annex II, Fig. 4-5) shows that in the implementation of the investment proposal will have negligible impact between – 0,01 to 0,03 %.  The local impact can be completely avoided (limited to 1%) by the package of mitigation measures and activities and mainly through reduction of the area of natural habitat 91 M0 Pannonian-Balkan Turkey Oak –sessile oak forests affected by the stock pile for mine waste.
<b>Deterioration of the qualities of habitats (structure and function)</b>	No impact	Can be expected week impact on local level during the construction and operation of elements of IP as result of complete deforestation, loss of 400-500 m ecotone, gas emissions, excavation and disposal activities of ore and rock masses, permanent vehicle movement and strong anthropogenic presence.  Deterioration of habitats in small area (less than 1 %)  Cumulative effect is likely in fires and accidents in flotation system for gold and operating the other mines.  The impact can be reduces to insignificant by package of mitigating measures and activities.	Can be expected week impact on local level during the construction and operation of elements of IP as result of complete deforestation, loss of 400-500 m ecotone, gas emissions, excavation and disposal activities of ore and rock masses, permanent vehicle movement and strong anthropogenic presence.  Deterioration of habitats in small area (less than 1 %)  Cumulative effect is likely in fires and accidents in flotation system for gold and operating the other mines.  The impact can be reduces to insignificant by package of mitigating measures and activities.
<b>Fragmentation</b>	No impact	There is week impact on local level and practically no impact on zone level and the biggest forest habitats are fragmented and not in the scope of IP.	There is week impact on local level and practically no impact on zone level and the biggest forest habitats are fragmented and not in the scope of IP.
<b>Reducing the size of the population (number of fields)</b>	No impact	There is likely weak impact, which is reversible for insignificant part of	There is likely weak impact, which is reversible for insignificant part of



		the population (less than 1 %) The impact can be reduced and even eliminated by package of mitigating actions and measures	the population (less than 1 %) The impact can be reduced and even eliminated by package of mitigating actions and measures
<b>Mortality of specimen</b>	No impact	There is likely weaker impact on local level due to the inclusion of smaller % of oak formation in the area of IP. The imago remains to be vulnerable to the light and noise pollution, explosive activities, permanent traffic and anthropogenic presence. Larvae are dependent on food and spatial resources, which will probably will be reduced. Most likely less than 1 % of the population of the species in the area and the zone will be affected. The impact can be reduced and even eliminated by package of mitigating actions and measures	There is likely weaker impact on local level due to the inclusion of smaller % of oak formation in the area of IP. The imago remains to be vulnerable to the light and noise pollution, explosive activities, permanent traffic and anthropogenic presence. Larvae are dependent on food and spatial resources, which will probably will be reduced. Most likely less than 1 % of the population of the species in the area and the zone will be affected. The impact can be reduced and even eliminated by package of mitigating actions and measures
<b>Violation of bio-corridors function</b>	No impact	Expected impact is insignificant and can be removed by the package mitigating action and measures.	Expected impact is insignificant and can be removed by the package mitigating action and measures.
<b>Risk of contamination during accidents in the built infrastructure (worst case scenario)</b>	No impact	There are likely impacts because of the possibility of air and soil pollution in the area of IP in accidents on enrichment plant and terroristic attacks. This will decline the quality of the habitat and will affect not more than 1 % of total area of the habitat in the region.	There are likely impacts because of the possibility of air and soil pollution in the area of IP in accidents on enrichment plant and terroristic attacks. This will decline the quality of the habitat and will affect not more than 1 % of total area of the habitat in the region.
<b>Increased risk of fires</b>	No impact	There are likely impact because of explosive activities, permanent traffic, engines, electricity, cigarettes and permanent anthropogenic presence. As a result of fires will be destroyed mainly larvae and their food substrate and will be affect less than 1 % of the habitat area and population in the region.	There are likely impact because of explosive activities, permanent traffic, engines, electricity, cigarettes and permanent anthropogenic presence. As a result of fires will be destroyed mainly larvae and their food substrate and will be affect less than 1 % of the habitat area and population in the region.
<b>Invasion of foreign species in the natural habitats</b>	No impact	Likely weak impact	Likely weak impact

### **1083 LUCANUS CERVUS (LINNAEUS, 1758)**

In the area of the investment proposal were found 4 specimens (one male and three female) *Lucanus cervus*. They were collected near the future open pit and below it - in the area planned for the stock pile for sterile rock masses, as well as on the South-Eastern slopes of Ada Tepe, where small and fragmented oak groves are found. Since the larvae of this species develop over very long periods (5-8 years) in rotten wood trunks, stumps and roots of deciduous trees (oak, less frequently in the birch, willow, pear, beech, ash trees), they will be entirely dependent on the presence of such substrates in the investment proposal. It is known that reduction defragmentation of its habitat (the reduction and disappearance of old and natural deciduous and mixed forests and their defragmentation) is the main reason for the reduction of the species' presence.

The imago is active (flying) in the evening and early hours of the night, which makes it vulnerable to the presence of dust, noise and light pollution of its habitat (disturbance, disorientation, increased road traffic



resulting in increased mortality caused by collision with vehicles). The increased risk of fires and accidents in the area of investment proposal therefore are also factors to be considered.

Just as with the previous species, the feeding and development of *Lucanus cervus* in the region also has direct connection with one of the main habitats in the protected zone, namely 91 M0 Pannonian-Balkan Turkey Oak –sessile oak forests on which, as mentioned above, the investment proposal will not have a significant impact (and this is also the case for other habitats, including beech and hornbeam) even at the local level, since North of the area of the investment proposal larger forests can be found.

Therefore, the assessment of the likelihood and extent of the impact of the IP on the FCS parameters of *Lucanus cervus* (Table 5, Annex II, Fig. 2) is similar to that of *Cerambyx cerdo* and also shows that in the implementation of the investment proposal in its alternatives, the species' habitat will be insignificant – between 0.01 and 0.03 percent. On local level it will vary between 7.3% (at Alternative 1 with decreased outer contour (area)) and 11.64 percent (Alternative 2 + road impact zone).

The impact on local level also might be avoided (reduced to 1 percent) with packet of mitigation activities and measures mainly by lowering the affected (covered) area of natural habitat 91 M0 Pannonian-Balkan Turkey Oak –sessile oak forests by the mining waste equipment (Annex II, Fig. 2). The impact assessment of the other FCS parameters of the specie also shows that by the realisation of the IP, it will not render significant negative impact on the specie and will be almost avoided by implementing the packet of mitigation activities and measures.

**Table 18.** Assessment of the possibility and the level of impact on the FCS parameters of *Lucanus cervus* in the scope of the protected zone

Alternatives / Impacts	Zero alternative	Alternative 1	Alternative 2
<b>Direct destruction and damaging of habitats (total area)</b>	No impact	The loss of habitat on zone level will be insignificant – from 0.01 to 0.03 %.  The local impact can be completely avoided (limited to 1%) by the package of mitigation measures and activities and mainly through reduction of the area of natural habitat 91 M0 Pannonian-Balkan Turkey Oak – sessile oak forests affected by the stock pile for mine waste.	The loss of habitat on zone level will be insignificant – from 0.01 to 0.03 %.  The local impact can be completely avoided (limited to 1%) by the package of mitigation measures and activities and mainly through reduction of the area of natural habitat 91 M0 Pannonian-Balkan Turkey Oak – sessile oak forests affected by the stock pile for mine waste.
<b>Deterioration of the qualities of habitats (structure and function)</b>	No impact	Can be expected week impact on local level during the construction and operation of elements of IP as result of complete deforestation, loss of 400-500 m ecotone, gas emissions, excavation and disposal activities of ore and rock masses, permanent vehicle movement and strong anthropogenic presence.  Deterioration of habitats in small area (less than 1 %)  Cumulative effect is likely in fires and accidents in flotation system for gold and operating the other mines.  The impact can be reduces to insignificant by package of mitigating measures and activities.	Can be expected week impact on local level during the construction and operation of elements of IP as result of complete deforestation, loss of 400-500 m ecotone, gas emissions, excavation and disposal activities of ore and rock masses, permanent vehicle movement and strong anthropogenic presence.  Deterioration of habitats in small area (less than 1 %)  Cumulative effect is likely in fires and accidents in flotation system for gold and operating the other mines.  The impact can be reduces to insignificant by package of mitigating measures and activities.
<b>Fragmentation</b>	No impact	There is week impact on local level and practically no impact on zone level and the biggest forest habitats are fragmented and not	There is week impact on local level and practically no impact on zone level and the biggest forest habitats are fragmented and not



		in the scope of IP.	in the scope of IP.
<b>Reducing the size of the population (number of fields)</b>	No impact	There is likely weak impact, which is reversible for insignificant part of the population (less than 1 %)  The impact can be reduced and even eliminated by package of mitigating actions and measures	There is likely weak impact, which is reversible for insignificant part of the population (less than 1 %)  The impact can be reduced and even eliminated by package of mitigating actions and measures
<b>Mortality of specimen</b>	No impact	There is likely weaker impact on local level due to the inclusion of smaller % of oak formation in the area of IP.  The imago remains to be vulnerable to the light and noise pollution, explosive activities, permanent traffic and anthropogenic presence.  Larvae are dependent on food and spatial resources, which will probably, will be reduced.  Most likely less than 1 % of the population of the species in the area and the zone will be affected.  The impact can be reduced and even eliminated by package of mitigating actions and measures	There is likely weaker impact on local level due to the inclusion of smaller % of oak formation in the area of IP.  The imago remains to be vulnerable to the light and noise pollution, explosive activities, permanent traffic and anthropogenic presence.  Larvae are dependent on food and spatial resources, which will probably, will be reduced.  Most likely less than 1 % of the population of the species in the area and the zone will be affected.  The impact can be reduced and even eliminated by package of mitigating actions and measures
<b>Violation of bio-corridors function</b>	No impact	Expected impact is insignificant and can be removed by the package mitigating action and measures.	Expected impact is insignificant and can be removed by the package mitigating action and measures.
<b>Risk of contamination during accidents in the built infrastructure (worst case scenario)</b>	No impact	There are likely impacts because of the possibility of air and soil pollution in the area of IP in accidents on enrichment factory or terrorist attacks. This may lead to worsen the habitat and may affect less than 1 percent of the habitat area.	There are likely impacts because of the possibility of air and soil pollution in the area of IP in accidents on enrichment factory or terrorist attacks. This may lead to worsen the habitat and may affect less than 1 percent of the habitat area.
<b>Increased risk of fires</b>	No impact	There are likely impact because of explosive activities, permanent traffic, engines, electricity, cigarettes and permanent anthropogenic presence. As a result of fires will be destroyed mainly larvae and their food substrate and will be affect less than 1 % of the habitat area and population in the region.	There are likely impact because of explosive activities, permanent traffic, engines, electricity, cigarettes and permanent anthropogenic presence. As a result of fires will be destroyed mainly larvae and their food substrate and will be affect less than 1 % of the habitat area and population in the region.
<b>Invasion of foreign species in the natural habitats</b>	No impact	Likely weak impact	Likely weak impact

### **1089 MORIMUS FUNEREUS (MULSANT, 1863)**

The species has not been established in the area of the investment proposal and the known locations of its populations do not fall within the IP area or in its area of influence. However, there are some suitable habitats for this species (Appendix I, Fig. 11).

### **\* 1087 ROSALIA ALPINA (LINNAEUS, 1758) (ALPINE ROZALIA)**

The type is a priority species, but has not been established in the Eastern Rhodope so far (Georgiev et al., 2004), respectively, has not been established in the area of the investment proposal.

Although these two species *Morimus funereus* and *Rosalia alpina* were not established on the territory of the investment proposal, the expert hypothetically assumes their presence in the area of investment proposal (especially of *Morimus funereus*, because it is found in the areas of the villages Perunika and Doborsko). Both prefer mixed deciduous forests and their models in GIS are the same (Annex I, Fig. 11,



12) with those in *Cerambyx cerdo* and *Lucanus cervus* (Annex I, Fig. 9, 10). Therefore, analysis of the impact of investment proposal on both species and the conclusion on the impact of investment proposal on FCS of these types in practices will not differ from the analysis on the impact on *Cerambyx cerdo* and *Lucanus cervus* (see also Table 17 and 18).

#### **4022 PROBATICUS SUBRUGOSUS (DUFTSCHMID, 1812) (WRINKLED PROBATIKUS)**

The specie is not detected in Eastern Rhodope, respectively it is not detected on the territory of the IP.

##### **4.3.1. Conclusions about the expected impacts on invertebrates.**

In the implementation of the investment the following negative impacts on representatives of the invertebrate fauna and their habitats are possible:

- ✦ Direct destruction of habitats and populations during the construction, operation: 1) Insignificant impact at the level of the protected zone and significant, permanent and irreversible impact at local/local level on the habitats and the populations of: *Callimorpha (Euplagia) quadripunctaria* (on zone level: loss of habitat – 0.56 % in Alternative 1); on local level – 23.46 % and 2) insignificant on local level for habitats and populations of *Cerambyx cerdo* and *Lucanus cervus*.
- ✦ In alternative 2 of exist risk of accidents which could lead to pouring toxic materials to the river. This could have impact on population of *Unio crassus* in the zone. In this stage it is hard to be estimated the probability of occurrence.

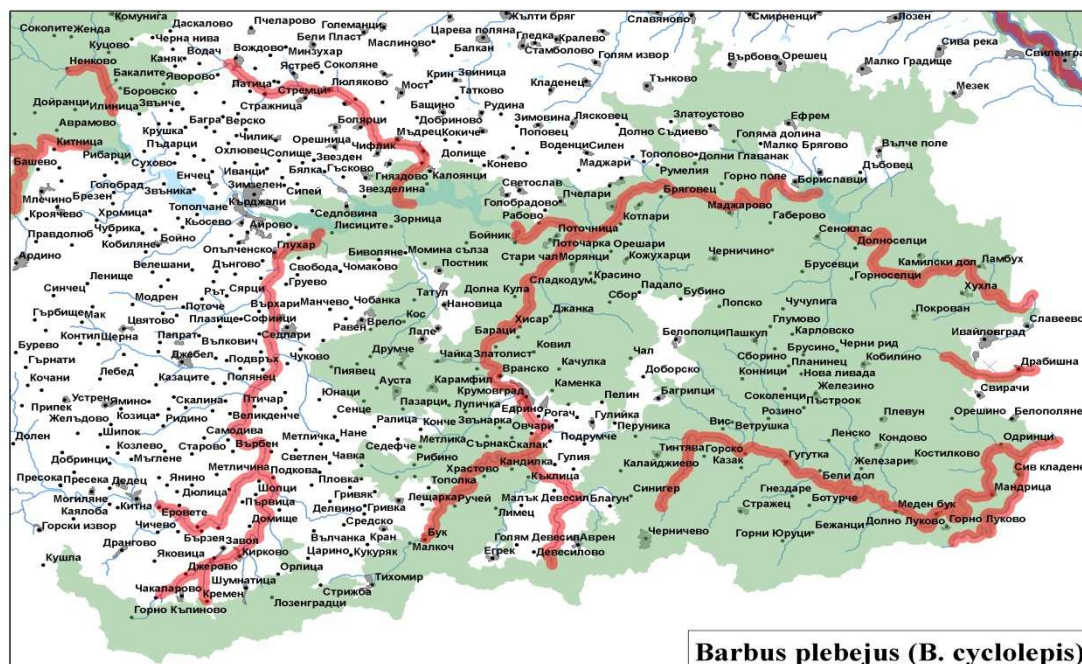
##### **4.4. Assessing the impact of the proposal in its implementation and in the implementation of alternative sites on the species of fish**

During field trials in the area and according to data from scientific literature, on the territory of the investment proposal were established two types of fish included in Annex II of Directive 92/43/EEC. Below is an assessment of the potential impact of implementation of the IP on their FCS in the protected zone BG 0001032 "Eastern Rhodope".

#### **1137 Barbus cyclolepis (Barbus plebejus)**

During field studies in the region this species were found in all stations, namely: Krumovitsa River after village of Lower Kula; Krumovitsa River, near Potochnitsa; Krumovitsa River after village Dzhanka; Krumovitsa River, by village Malko Kamenyane ; Krumovitsa River under the bridge before the village Devisilovo; Krumovitsa River, in Krumovgrad and in the Bjalata Reka River. In all fields *Barbus cyclolepis* is fairly evenly distributed with stable populations. The total length of river sections in which the species occurs within the zone is estimated at 207,268 kilometres (Fig. 1). Location where it is found outside the zone are not included but are out of shape.

**Figure 1.** Distribution *Barbus cyclolepis* in the area of protected zone Eastern Rhodope



Potentially endangered river stretches in which species will be affected due to implementation of the IP is estimated at 5 kilometres (alternative 1; river valley of Krumovitsa) and 52 km (alternative 2; Krumovitsa and Arda near Ivaylovgrad dam)

In considering the worst-case-scenario in alternative 1 (accidents in the system and discharge of chemical compounds and other compounds in the Krumovitsa River respectively Arda River) could be affected about 2,5 % of the riversides where the species is. The fact that alternative 2 doesn't include usage of toxic compounds mortality of individuals is not expected. Impact of the IP on FCS is presented on table 19.

In considering the worst-case-scenario in alternative 2 (accidents in the system and discharge of chemical compounds and other compounds in the Krumovitsa River respectively Arda River) under the prevention principle, in these areas will be destroyed the entire populations of the species. This represents 25.2 percent of river sections in which the species occurs within the zone. Because *Barbus cyclolepis* is evenly distributed in sections it inhabits, this figure represents the percentage of the potential loss of population of the species in the zone, which is significantly above the threshold of 1 percent. As displayed in Table 19, the possible implementation of the investment plan will adversely affect the FCS parameters.

**In alternative 1 significant impact on the species is not expected.**

**Table 19. *Barbus cyclolepis***

Impacts	Zero Alternative	Alternative 1	Alternative 2
<b>Direct destruction of habitats</b>	No impact	Habitats of the species will not be affected directly.	Habitats of the species will not be affected directly.
<b>Deterioration of the quality of the habitat</b>	No impact	There is a weak impact. Less than 1 % of population of the species will be affected.	There is a weak impact. Less than 1 % of population of the species will be affected.
<b>Mortality of specimens</b>	No impact	There is a weak impact. Less than 2,5 % of population of the species will be affected.	There is a weak impact. Less than 2,5 % of population of the species will be affected.
<b>Risk of incidental contamination in</b>	No impact	There is likely About 2,5 % of population of the species	There is likely About 2,5 % of population of the species in the

the event of incidents in the built infrastructure (worst-case-scenario)		in the zone will be affected.	zone will be affected.
Influx of foreign species in natural habitats	No impact	Likely insignificant impact	Likely insignificant impact

The impact on *Barbus cyclolepis* on national level will be below 0.1%. Taking in account that the species is widespread on all feeders of Aegean. Unlike most other kinds of barbell, this type is much more flexible and almost inhabits rivers top currents (so-called trout zone) a few kilometres from river outflow, as in most of these sites is a dominant species.

**1146 Sabanejewia balcanica (Sabanejewia aurata) (Balkan loach).**

During the field study in the region this species was established in three stations: Krumovitsa River after village of Lower Kula, Krumovitsa River, near Potochnitsa and in the Byalata Reka River. The total length of river sections in which the species occurs within the zone is estimated to be 80,878 km (Fig. 2).

**Figure 2.** Distribution of loach in the Balkan region of protected zone "Eastern Rhodope"



Potentially threatened river area (between the Krumovitsa River infusion of Kaldzhik Gully and the rivers' merge into Arda), in which species may be affected due to implementation of the IP is 5 kilometres for alternative 1 and 21 km for alternative 2.

In considering the worst case scenario for alternative 1 (accidents in the system and discharge of chemical compounds in the Krumovitsa River) could be affected about 6,2 % of the river valley where the species is located. The fact that alternative 2 don't include usage of toxic compounds mortality of individuals is not expected. Impact of the IP on FCS is presented on table 20.

In considering the worst case scenario for alternative 2 (accidents in the system and discharge of chemical compounds in the Krumovitsa River) according to the precautionary principle, in this region the entire populations of the species will be destroyed. This represents 25,8 percent of river sections in which the species occurs within the zone. Unlike the previous species, Balkan loach has a denser population and better preserved population in the Byalata and Luda rivers. Field studies showed about 2-3 times higher relative density of the populations in these rivers compared with Krumovitsa River. This means that the



percentage of the potential loss of population of the species in the protected zone wouldn't be about 12 percent, which is well above the minimum threshold for FCS. Impact of the IP on FCS is presented on table 20.

**In alternative 1 significant impacts on the species is not expected.**

**Table 20.** Balkan loach

Impacts	Zero Alternative	Alternative 1	Alternative 2
<b>Direct destruction of habitats</b>	No impact	Habitats of the species will not be affected directly.	Habitats of the species will not be affected directly.
<b>Deterioration of the quality of the habitat</b>	No impact	There is a weak impact. Less than 1 % of population of the species will be affected.	There is a weak impact. Less than 1 % of population of the species will be affected.
<b>Mortality of specimens</b>	No impact	There is possible impact in case of accidents, but mortality of individuals are not expected.	There is possible impact in case of accidents, but mortality of individuals are not expected.
<b>Risk of incidental contamination in the event of incidents in the built infrastructure (worst-case-scenario)</b>	No impact	About 6,2 % of the habitats will be affected.	About 12 % of the habitats will be affected.
<b>Influx of foreign species in natural habitats</b>	No impact	Likely insignificant impact	Likely insignificant impact

**The impact on *Sabanejewia balcanica* on national level in harder to be estimated. The species inhabits the upper middle rivers of Dunabe and some of Maritsa.**

#### Other established fish species

Beside the above two species during field studies in the region were down another 13 species of fish that are not included in Annex II of Directive 92/43/EEC. *Rhodeus amarus*, which also falls within Annex II was established in the area of IP, but only in the Byala River near villages Meden Buk and Gugutka and therefore is not subject to this assessment.

Data for all species found in fields can be summarized in Table 21.

**Table 21.**

Location	Code	Species
Krumovitsa river near v. Dolna Kula	KR 01/08	<i>Alburnus alburnus</i> <b><i>Barbus cyclolepis</i>*</b> <i>Gobio bulgaricus</i> * <i>Pseudorasbora parva</i> <i>Squalius orpheus</i> * <i>Vimba melanops</i> * <i>Cobitis strumicae</i> * <b><i>Sabanejewia balcanica</i>*</b>
Krumovitsa river near v. potochnitsa	KR 02/08	<b><i>Barbus cyclolepis</i>*</b> <i>Carassius gibelio</i> <i>Gobio bulgaricus</i> *





		<i>Pseudorasbora parva</i> <i>Squalius orpheus*</i> <i>Vimba melanops*</i> <i>Cobitis strumicae*</i> <b><i>Sabanejewia balcanica*</i></b> <i>Lepomis gibbosus</i>
Krumovitsa river near v. Djanka	KR 03/08	<b><i>Barbus cyclolepis*</i></b> <i>Carassius gibelio</i> <i>Gobio bulgaricus</i> <i>Squalius orpheus*</i> <b><i>Cobitis strumicae*</i></b>
Krumovitsa river near v. M. Kamenyane	KR 04/08	<b><i>Barbus cyclolepis*</i></b> <i>Gobio bulgaricus*</i> <i>Squalius orpheus*</i> <b><i>Cobitis strumicae*</i></b>
Krumovitsa river near v. Devesilovo	KR 05/08	<b><i>Barbus cyclolepis*</i></b> <i>Gobio bulgaricus*</i> <i>Squalius orpheus*</i> <b><i>Cobitis strumicae*</i></b>
Krumovitsa river near krumovgrad	KR 00/08	<b><i>Barbus cyclolepis*</i></b> <i>Gobio bulgaricus*</i> <i>Squalius orpheus*</i> <b><i>Cobitis strumicae*</i></b>
Byala river near Gugutka	BR 01/08	<b><i>Barbus cyclolepis*</i></b> <i>Gobio bulgaricus*</i> <b><i>Rhodeus amarus</i></b> <i>Squalius orpheus*</i> <i>Vimba melanops*</i> <b><i>Cobitis strumicae*</i></b>
Byala river near Meden Buk	BR 02/08	<b><i>Barbus cyclolepis*</i></b> <i>Gobio bulgaricus*</i> <b><i>Rhodeus amarus</i></b> <i>Squalius orpheus*</i> <b><i>Cobitis strumicae*</i></b> - струмски щипок <b><i>Sabanejewia balcanica*</i></b> - балкански щипок <i>Proterorhinus semilunaris</i> – мраморно попче
Arda river neat Madjarovo	AR 01/08	<i>Alburnus alburnus</i> - уклей <b><i>Barbus cyclolepis*</i></b> - маришка мряна <i>Rutilus rutilus</i> - бабушка <i>Squalius orpheus*</i> - егейски речен кефал <i>Vimba melanops*</i> - маришки морунаш <i>Sander lucioperca</i> - обикновена бяла риба



#### 4.4.1. Conclusions about the expected impact on fish in the implementation of investment proposal "Extraction and processing of gold ores from study area" Krumovgrad "

In alternative 1 normal operation with no accidents on operation of the mine for gold ores from study area "Krumovgrad", significant negative impacts on representatives of ichthyofauna is not expected.

There is possibility of occurrence of accident. There is no risk management assessment from the investor of the element of the project. As consequence, the assessment should be based on the presumption of occurrence of accidents related to getting chemical agents in the environment and watershed of the river. Thus reflecting the precautionary principle as laid down in the meaning of art. 6 (3) of Directive 92/43. Under the precautionary principle in case of accident (alternative 2) is likely to reach out to damage the integrity, purpose and objectives of the zone: there is a risk of failure in the system, which can lead to potential threat to about 25,2 % of the population of *Barbus cyclolepis* and about 12 % of the population of *Sabanejewia balcanica* in the zone.

The danger of influx of invasive species and change in the species composition in the area of the investment plan is negligible.

Cumulative effect is possible in the development of additional fields and in the development of other investment plans in the region, which will cause significant adverse impact at the zone.

#### 4.5. Assessment of the impact of the investment proposal in its implementation and in the implementation of alternative sites on reptiles and amphibians.

##### 4.5.1. Introduction

Natura 2000 assessment of this IP in view of reptiles (mainly tortoises) is consisted of assessing the impact on 2 tortoise species in the region – *Testudo graeca* and *Testudo hermanni*. The assessed territory has total area of 94,6 ha. This amount includes buffer zone, 30 m around the boundaries of the IP territory – about 15 ha.

All elements of the IP were taken into account – the mine, facility for mining waste, landfills for soil materials etc. Total area of all components is 85 ha. IP is located in territory of protected zone Eastern Rhodope.

The assessment includes all phases of the development of the IP - construction, operation and reclamation.

##### Materials and methods. Analysis of data. **Area of the habitats**

Tortoises from both species inhabit the entire area of IP. The boundaries of IP are not boundaries of the impact on the populations of tortoises. In the absence of a mechanical barriers (fences) restricting the territory, the substantial impact is extended with about 300 meters beyond the territory. This requires the assessment to be conducted for an extended territory, which includes a buffer zone. The size of this buffer zone is consistent with the individual inhabited territories of the specimens of both types of tortoises. Further below by combined impact and combined area is meant the area of the IP plus the area of the buffer zone and by direct impact and direct area is meant only the area of the IP.

Fragmentation of the territory is not observed. The existing roads are very narrow and with very low traffic. The natural linear barriers (rivers) are surmountable and are not a barrier for the dissemination and communication between different parts of the populations.

As a result of the field studies were identified the specific areas with varying degree of in habitat suitability for tortoises. There are 3 such zones. The most important is assigned one zone (zone 1) occupying the lower part of mining waste facility installation and production of concentrate and total cover of about 47 ha. These areas are occupied mainly by sparse forest type 91MO, 5210. As well as mixed forests with low density and small meadows. Zone 2 – monocultures of *Pinus nigra* and *Rhobinia pseudoacacia* with good exposure, gardens. Area – directly 48 ha. Zone 3 – monoculture of *Pinus nigra* and *Rhobinia pseudoacacia* with negative statement partially deciduous forests. Zone 3 is 4,5 ha – combined and 7 ha – directly.

In order to determine the reference population, it is necessary to determine the area of the appropriate natural habitats. For the purposes of Natura 2000 the CORINE Land Cover was used as basis. For this case, data for the land areas and the impact on them is given in Table 21. The determination of areas of key habitats within the area of combined or direct IP is performed at field studies to reduce the error in determination the size and characteristics of microrelief.

**Table 22.** Area of habitats



Land area	Habitats (hectares)	Key habitats (hectares)
Gulia	<b>111,8635725</b>	<b>54,39744</b>
Dazhdovnik	<b>105,0353477</b>	<b>41,63094</b>
Skalak	<b>492,8232393</b>	<b>372,5665</b>
Sarnak	<b>625,9854532</b>	<b>300,8419</b>
Ovchari	<b>315,7369981</b>	<b>172,0467</b>
Zvanarka	<b>382,8650999</b>	<b>236,3949</b>
Kaklitsa	<b>1082,988207</b>	<b>574,9909</b>
Malko Kameniane	<b>194,0439546</b>	<b>62,41843</b>
<b>Total</b>	<b>3311,341872</b>	<b>1661,585</b>

The suitable habitats for both species in the territory of IP have about 94,6 ha or 2,9 % of total area. Key habitats are determined as 47 ha (2,8 %).

**Table 23.** Assessment of the impact of the IP on the total area of tortoise habitats in the protected zone BG0001032 "Eastern Rhodope"

Protected zone BG0001032 "Eastern Rhodope"	Habitats – <b>196132.1 ha</b>	Key habitats <b>74117.7 ha</b>
Impact of IP	<b>0,048%</b>	<b>0,063%</b>

### Population within the protected zone

#### Number of adult specimens - actual population

The filed surveys conducted over 10 days determined the main characteristics of the part of the tortoise population, inhabiting the territory. The completeness and accuracy of the collected data is nevertheless limited by the restricted timeframe and the fact that the surveys were conducted during an active season.

Information on the numbers and density of the populations of both species in the region can be found in the Report of Associate Professor Dr. Boyan Milchev on the task "Study on ornithofauna and herpethofauna in Ada Tepe concession region, species and zones of significance for conservation". Useful information can be found in the 1973 survey by Vladimir Beshkov on the abundance of tortoises in the country.

Field information on the number of tortoises was collected using a standard linear trans-sectional method for areas with potentially lower numbers (Zones 3, 4 and 5) and by the method of marking and re-catching for Zone 1 and Zone 2.

The ascertained numbers for both species are:

**Table 24. Alternatives 1 and 2**

	Average density (numbers per hectare) ( <i>Testudo graeca</i> )	Average density (numbers per hectare) ( <i>Testudo hermanni</i> )	Zone area (hectares) direct
Zone 1	8	6	47
Zone 2	6	5	43
Zone 3	0.1	0.1	4,5
<b>Total</b>			<b>94,6</b>

**Table 25.** Alternatives 1 and 2- Number of affected tortoises

<b>Testudo graeca</b>	Number of affected tortoises
direct	635
<b>Testudo hermanni</b>	Number of affected tortoises
direct	498

The calculated ratio of both species is 1.26:1, *Testudo graeca* to *Testudo hermanni*.

#### 4.5.2. Determining the reference population.

##### Reference population

The reference population was determined according to the model for determining the national population and for providing the information for Natura 2000, developed by "Balkani" Wildlife Society. The results were verified by the model, proposed by the Bulgarian Herpetological Society.

According to the model for determining the reference population:

For *Testudo graeca* (Table 26) the maximum potential numbers in all affected areas are **12 402**, the average numbers are **8 463** and the minimum numbers are **4 533**.

**Table 26.** *Testudo graeca*

Land area	Maximum number	Minimum number	Average number
Gulia	45	16	30
Dazhdovnik	179	38	108
Skalak	2102	823	1461
Sarnak	2916	1130	2022
Ovchari	1409	501	955
Zvanarka	1196	345	770
Kaklitsa	4253	1590	2921
Malko Kameniane	302	90	196
<b>Total</b>	<b>12402</b>	<b>4533</b>	<b>8463</b>

**Table 27.** Total number of *Testudo graeca* at protected zone BG0001032 "Eastern Rhodope" and IP's impact on its numbers

	Maximum numbers	Minimum numbers	Average
Total for protected zone BG0001032 "Eastern Rhodope"	484007	184547	334107
Impact of IP	0,13	0,34	0,19

For *Testudo hermanni* (Table 28) the maximum potential numbers in all affected areas are 15 836, the average numbers are 11 006 and the minimum numbers are 6 175.

**Table 28.** *Testudo hermanni*

Land area	Maximum number	Minimum number	Average number
Gulia	119	38	79
Dazhdovnik	238	60	149
Skalak	2853	1165	2009
Sarnak	3332	1353	2342
Ovchari	1831	683	1257

Zvanarka	2142	847	1495
Kaklitsa	5010	1933	3471
Malko Kameniane	311	96	204
<b>Total</b>	<b>15836</b>	<b>6175</b>	<b>11006</b>

**Table 29.** Total number of *Testudo hermanni* at protected zone BG0001032 "Eastern Rhodope" and IP's impact on its numbers

	Maximum numbers	Minimum numbers	Average
Total for protected zone BG0001032 "Eastern Rhodope"	782387	284149	533229
Direct impact (%)	0,064	0,18	0,093

### Gender structure - adults

The ratio between male and female adult specimens of both species in the study area is within the optimum.

### Age class structure

The difficulty to find the smallest specimens – young and newly hatched, makes the assessment on this criterion almost impossible over such a short time. However, judging on the number of laying females and on the probability for a successful hatching, an approximate estimation of the situation can be made.

Between 24-30 May 2008 at Zone 2 and the rest of the IP area were not observed any tortoise nests, dug up from predators. This is probably due to the large number of suitable places for laying and to their small area. This makes them more difficult to be found and therefore, they are better protected.

In Zone 1 during the same period the situation is radically different. During the observation of 5 laying female specimens and the conducted monitoring of nests, it was established that within 3 days after laying all 5 nests were destroyed. Judging from the found traces this was probably done by a small predator – a polecat or a domestic cat, or both. During the second visit to the field between 11-13 August 2008 were found nests, where young tortoises had successfully hatched. The question whether the same predators feed on newly hatched tortoises and what proportion of them survives still remains. The strong pressure by predators in Zone 1 makes it especially vulnerable to all kinds of biotope fragmentation and to influx of foreign species to the zone.

### Existing anthropogenic impact

The anthropogenic impact on the populations of both types of tortoises consists of:

- ✦ Population - low density, absence of tortilophagia and local poaching, good or neutral attitude towards the tortoises.
- ✦ Monocultures of pine and locust trees - a slight negative impact
- ✦ Grazing - two herds of cattle (about fifteen animals each) feed in the zone. The first feeds primarily in Kaldzhik Gully and the other one feeds in Zone 1. The herds have a positive impact, especially in Zone 1.
- ✦ Mowing is not done – observed were initial stages of overgrowth of pastures, which could reduce the suitable for egg laying locations.
- ✦ Agricultural activities - extensive land use, almost complete absence of machine work of the land. A progressive reduction of arable land is observed. Few of the fields were surrounded by fences which could impede the free movement of tortoises.

### 4.5.3. Other types of reptiles

Except the two types of tortoises in protected zone BG0001032 "Eastern Rhodope", other Natura 2000 species also inhabit the zone - reptiles: Four-lined snake (*Elaphe quatuorlineata* code 1279). European pond turtle (*Emys orbicularis* code 1220), Caspian pond turtle (*Mauremys caspica* code 1222), and also



amphibians: Yellow-bellied toad (*Bombina variegata* code 1193) and Southern crested newt (*Triturus karelinii* code 1171).

1. **Four-lined snake** (*Elaphe quatuorlineata*) – the species was not discovered in the territory of the IP.
2. **European pond turtle** (*Emys orbicularis*) – the species was also not discovered in the territory of the IP, but it is a species which appears along the valley of the Krumovitsa River and the connected rivers. Potentially their population may be harmed only in case of an accident with leakage of hazardous substances.
3. **Caspian pond turtle** (*Mauremys caspica*) – the species was not discovered in the territory of the IP.
4. **Yellow-bellied toad** (*Bombina variegata*) – the species are found in the territory of the IP. It can be observed exclusively in fountains and flooded areas around them. The total number of this species in the region is less than 500 specimens. For a rapidly reproducing species that is widespread in the affected land and throughout the entire country, this numbers are negligible.
5. **Southern crested newt** (*Triturus karelinii*) - the species was not discovered in the territory of the IP. The only suitable biotope for it - a potential breeding place in the region, is the water reservoir at the village of Skalak. Even if it were to be found there, the numbers would be low because of the small size of the water reservoir.

#### 4.5.4. Assessment of the development phases of the IP.

##### 1. Assessment of the construction phase

The first phase is characterized by intensive use of the areas with direct impact on the populations of tortoises. These areas become unsuitable for tortoises.

##### 2. Assessment of the operational phase

After construction, the direct impact on the territory does not change significantly – it remains unsuitable for tortoises during the entire period of operation. The impact on the buffer zone also becomes significant. The main reasons for this are the intensive blasting activities – dust emissions, noise and seismicity. Last but not least is the unavoidable change in the hydrological regime, especially in zone 1, located near the open pit and the installation for extraction of gold. With a high degree of certainty it can be claimed that zone 1 and zone 2 will be lost for the tortoises and because of the fact that the grazing will stop, the already started overgrowth in the territories will continue. The heavy traffic caused by the IP is also a factor for the reduction the tortoise population.

##### 3. Assessment of reclamation phase

Both tortoise species are highly dependent on the existence of developed micro-relief. As relatively slow-moving animals, they inhabit areas with many shelters, using them as protection from predators and from severe weather conditions. The tortoises avoid plain areas with shallow groundwater and with a potential danger of flooding. They depend on places for laying eggs, which must meet certain microclimatic, soil and hydrological conditions, and which are extremely difficult to be created.

Full restoration of the habitats of tortoises, where possible, is a complex task that may take more than 10 years and which would require solid financial resources.

#### 4.5.5. Recommendations

Recommendations – construction

In order to reduce the impact of IP on both tortoise species it is necessary to build fencing which will stop passing. The fencing should be 80 cm and 20 cm dug onto the ground (total of 100 cm). The fencing should have good maintenance. This assessment is valid if this fencing is available.

During the consultations there was outlined contour of 5740 m length at least 30 m distance from each element of IP. It is recommended that in those 30 m possible soil and vegetation cover be maintained. Along the contour and around the new built road should be built fencing. Building the fencing should be carried out at least 1 year before beginning the construction activities. During that year competent personnel carry out every tortoise found inside the fencing.

Recommendations – operation



It is necessary the fencing to be maintained in functioning condition. It is recommended to do monitoring of population of the tortoises and in case of coming across with anxiously tendency adequate measures should be taken.

Recommendations – rehabilitation

Removing the fencing should be done after conclusion the rehabilitation of the mine. Plant cover should be consisting of local species.

#### 4.5.6. Conclusion

Compatibility assessment of the investment proposal (IP) for gold ore extraction in the concession area "Ada Tepe" from herpetological aspect consists of the impact assessment of the existing on the territory populations and habitats of tortoises: Herman's tortoise (Law on Biological Diversity annex 2, Directive 92/43/EEC, Natura 2000 species code 1217 and Latin name *Testudo hermanni* Gmelin) and Spur-thighed tortoise (Law on Biological Diversity annex. 2, Directive 92/43/EEC, Natura 2000 species code 1219 and Latin name *Testudo graeca* Linnaeus). The IP is located in a protected zone BG0001032 "Eastern Rhodope".

During the impact assessment the factors affecting the local part of the population were considered with high priority. The IP's impact on the population throughout the entire protected zone is weak, but this is due to the large area of protected zone BG0001032 "Eastern Rhodope". Therefore, it is reasonable to do the impact assessment at the level of village territories, as it is done.

The appropriate habitats for both species on the territory of the IP is are approximately 94.6 ha (2.9%). As key habitats are defined 47 ha (2,8 %).

Relative to the entire protected zone, the impact on the habitats is within the range 0,048-0,063%.

Territories under direct impact will not be able to fulfill their Natura 2000 objectives for a long period. Effectively, they will be removed from the protected zone. This is also the case for the buffer territories, but to a lesser extent. The IP will have a negative impact on the integrity of the territory (see Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites – Methodological guidelines on the provisions of art. 6 (3) and (4) from Habitats Directive 92/43/EEC).

During 2008 populations of both species were in good condition. FCS of both species was preserved.

The number of affected specimens is shown in table 25.

The relocation of tortoises could save them, but this represents a compensatory measure, which can only be resorted to on the grounds of overriding public interest.

The conservation status of Herman's tortoise (Law on Biological Diversity annex 2, Directive 92/43/EEC, Natura 2000 species code 1217 and Latin name *Testudo hermanni Gmelin*) and of Spur-thighed tortoise (Law on Biological Diversity annex. 2, Directive 92/43/EEC, Natura 2000 species code 1219 and Latin name *Testudo graeca Linnaeus*) and the fact that the IP will have a negative effect on the integrity of the territory infer that the impact of IP will be significant. In case of good implemented rehabilitation the habitat could perform again as part of Natura 2000.

The impact on the other types of amphibians and reptiles included in Natura 2000 and inhabiting the territory of the protected zone BG0001032 "Eastern Rhodope" is insignificant for the species Four-lined snake (*Elaphe quatuorlineata*) and Caspian pond turtle (*Mauremys caspica*). For the species European pond turtle (*Emys orbicularis*) and Southern crested newt (*Triturus karelinii*) there is a possible adverse impact in case of potential accident and leakage of hazardous substances into Krumovitsa River. Regarding the Yellow-bellied toad (*Bombina variegata*) the impact is negligible.

**The impact on population of *Testudo Hermannii* and *T. graeca* is significant during operation of the IP. The short period of implementation of the IP – 15 years, and the good predictions , makes the IP acceptable if the recommendations will be taken in account.**

**Alternative 2 potentially affect bigger part of the population of both species. Perhaps impact on zone level remains below 1 %, but alternative 2 will have more significant impact rather than alternative 1, therefore it is considered unacceptable.**

The impact in national level on both species tortoises is considered below 0,01 % which is insignificant. For the other reptile and amphibian species expected impact on national level is insignificant.

#### 4.6. Assessment of the impact of the investment proposal in its implementation and in the implementation of alternative sites on bats.



On the territory of the investment proposal so far have been identified four types of bats listed in Annex II of Directive 92/43/EEC. Below is the assessment of the potential impact of the implementation of the IP on their status in protected zone BG0001032 "Eastern Rhodope".

For the assessment of the IP on the bats' species, an object of protection in the PZ, a Conception of bat fauna and habitat protection in Bulgaria in the frame of Natura 2000 (Ivanova, 2005) is used, which is developed by assignment of CMAEP – MOEW.

#### **1304 *Rhinolophus ferrumequinum* (Greater Horseshoe bat)**

A small group of about 8-10 specimens is discovered inhabiting the old Thracian mine consisting of shallow underground galleries. The determined number represents barely 0.06% of the national number of that species (Ivanova, 2005). Conducted observations and surveys with ultrasonic recording equipment revealed that the species have a much broader feeding territory in the area of the IP and most likely specimens from neighbouring territories and colonies could also be discovered in the area. Hunting specimens of the species were regularly registered over the water surface of the Krumovitsa River at the junction near Skalak village. The fact that the species feeds above lawns, bushes and rocks, means that an integral part of its feeding habitat consists of the proposed sites for the construction of two settling ponds, soil landfills and waste-rock stockpiles Southeast of Ada Tepe. The established small summer colony in the Thracian pit uses the entire area of the proposed open pit as feeding territory. The development of the open pit will destroy irreversibly the daily shelter of the colony and most likely the animals will not be exterminated, but will be exiled. The area used by the colony as a feeding habitat will be considerably reduced, more precisely: the open pit area, the above mentioned soil landfills, stockpiles and settling ponds, the low-grade ore stockpile and the production site.

**Table 30.** Assessment of probability and impact level on Greater Horseshoe bat (*Rhinolophus ferrumequinum*)

<b>Parameters Impacts</b>	<b>Population (total for the entire PZ)</b>	<b>Total area of habitat within PZ</b>	<b>Total area of food habitats</b>	<b>Migration route</b>
Destruction and damaging of habitats	Irreversible for a very small part of the population (0.06% of the national number and 0,1 of the population in the PZ)	Negligible impact (0.037% of the PZ area)	Negligible impact	Migration routes not interrupted
Mortality of specimens	Only potential possibility when the Thracian pit is demolished	Has no impact	Has no impact	Has no impact
Disturbance	Significant within the boundaries of the IP, but insignificant for the entire PZ.	Negligible concerning the entire PZ (0.037%).	Has no impact	Has no impact
Air pollution	Reversible for a negligible part of the population (0.06% of the national number and 0.1% of the population in the PZ)	Deterioration of habitats in insignificant area (0.037% of the PZ area) as a result of the production activities	Reversible reduction of insignificant area (0.037% of the PZ area) as a result of local production pollution	Has no impact

The national population of the Greater Horseshoe rat is assessed as 15,000 species the expert report of Ivanova (2005). The IP directly affects barely 8-10 species, which uses the Ancient Thracian pit for daily shelter, which is insignificant.

#### **1324 *Myotis myotis* (Greater mouse-eared bat) / 1307 *Myotis blythii* (Lesser Mouse-Eared bat)**

Because of the specifics of the used field method, namely registration of echolocation ultrasounds and the extremely low frequency of occurrence of both species on the territory of the IP, the species differentiation was impossible. Both species are included in Annex II of Directive 92/43/EEC, while they have very similar biology and often form mixed colonies. Therefore the assessment of IP's impact on both species will be the same, as we assume the potential presence of both species at the area of the IP.

Ultrasounds with characteristics of both species were found twice in the area of the IP, more precisely: in transect covering the coniferous forest next to the planned open pit and above the water surface of Krumovitsa River, at the junction near Skalak village. Daily shelters of both species were not discovered at the area of the IP and their presence there is a result of their feeding activities. The bushes, the small





lawns and the surface water of Krumovitsa River provide favourable feeding conditions rich in insects, but the remoteness of their potential daily shelters is the reason for their rarity in the researched area.

**Table 31.** Assessment of probability and impact level on Greater Mouse-Eared bat (*Myotis myotis*). Lesser mouse-eared bat (*Myotis blythii*) and Common Bentwing bat (*Miniopterus schreibersii*)

Note:

The low impact percentage over the populations is determined by the extremely high number of the three species in Bulgaria (over 220 000 specimens by Ivanova, 2005), however mainly in underground habitats. In the area of Ada Tepe mainly single hunting specimens are recorded in the absence of their underground shelters on the territory of the IP.

Parameters Impacts	Population (total for the entire PZ)	Total area of habitat within PZ	Total area of food habitats	Migration route
Destruction and damage of habitats	Reversible for negligible part of the population (far below 0.0001%).	Negligible impact (0.0037% of the PZ area)	Negligible impact (0.0037% of the PZ area)	No impact
Mortality of specimens	Only potential possibility during the operation of the pit is assumed.	No impact	No impact	No impact
Disturbance	Significant within the boundaries of the IP, but insignificant for the entire PZ.	Negligible concerning the entire PZ (below 1 percent).	No impact	No impact
Air pollution	Reversible for a negligible part of the population (below 0.0001 percent).	Deterioration of habitats in insignificant area (0.0037% of the PZ area)	Reversible reduction of insignificant area (0.0037% of the PZ area)	Negligible impact

### **1310 *Miniopterus schreibersii* (Common Bentwing bat)**

Specimens of this species were registered in the lower parts of Ada Tepe, close to open areas above the water surface of Krumovitsa River, near Skalac village. The species most likely does not have daily shelters in the IP area, but uses the open areas and flies over the water surfaces for hunting and feeding purposes. Its frequency of occurrence is extremely low and the abovementioned areas are part of its feeding habitat. Since this species mostly uses underground karst cavities for daily shelters and often it inhabits them together with the Greater and the Lesser Mouse-Eared bat (*Myotis myotis* and *Myotis blythii*), the impact of IP's implementation is considered to be similar and in most cases identical for this species. This assessment for is presented in Table 2.

The national assessment of the Common Bentwing bat's population varies from 120,000 to 170,000 specimens in view of that the specie migrates and frequently forms summer and winter colonies in different underground shelters. The registered here single hunting specimens do not use the IP territory for daily or winter shelter and in practice there will not be any impact on national level.

### **1321 *Myotis emarginatus* (Geoffroy's bat)**

So far, the species has been discovered only once in a close proximity to the area of the investment proposal: the abandoned lodge "Ada Tepe". During previous surveys (Petrov B., Personal message) a large migratory colony was discovered at the abandoned lodge. The several visits afterwards did not confirm the presence of the species. Specie's echolocation ultrasounds were also not registered during the survey. Perhaps the area of Ada Tepe, Krumovitsa River and its tributaries is a part of local migratory corridor. From this perspective, the change of the water regime of Kaldzhik Gully, which is a local migratory corridor for the bats, and the conversion of parts of the gully to a tailings dam will have a negative impact on Geoffroy's bat in Eastern Rhodope. Given their occasional presence of the species here, the impact level of this factor is considered to be insignificant.

**Table 32.** Assessment of likelihood and level impact on Geoffroy's bat (*Myotis emarginatus*).

Parameters Impacts	Population (total for the entire PZ)	Total area of habitat within PZ	Total area of food habitats	Migration route
Destruction and damaging of habitats	Possible insignificant impact.	Negligible impact (below 0.0037 percent)	Negligible impact (below 0.0037)	Interruption of one local migration route and deterioration



			percent).	of the quality of another.
Mortality of specimens	Possibly has no impact.	No impact	No impact	No impact
Disturbance	Possible insignificant impact.	Negligible impact in the entire PZ (below 0.0037 percent).	No impact	No impact
Air pollution	Reversible impact for a negligible part of the population (below 0.0037 percent).	Deterioration of habitats in insignificant area (below 0.0037 percent).	Reversible reduction of insignificant area (below 0.0037 percent).	Negligible impact

The national assessment of the Geoffroy's bat's population is 100,000 species. The accident determination of migrating colony of couple of hundreds specimens near by the IP, but not in its territory, determined for its implementation, defines in practice the absence of impact on national level. The probability of establishment once again of migrating colonies in the abandoned building of Ada Tepe hut is minor.

**1302 Rhinolophus mehelyi (Mehely's Horseshoe Bat)**: The species is not established in the IP area.

**1303 Rhinolophus hipposideros (Lesser Horseshoe Bat)**: The species is not established in the IP area.

**1305 Rhinolophus euryale (Mediterranean Horseshoe Bat)**: The species is not established in the IP area.

**1306 Rhinolophus blasii (Blasius's Horseshoe Bat)**: The species is not established in the IP area.

**1308 Barbastella barbastellus (Western Barbastelle)**: The species habitat does not include the IP area.

**1316 Myotis capaccinii (Long-fingered Bat)**: The species is not established in the IP area.

**1323 Myotis bechsteinii (Bechstein's Bat)**: The species habitat does not include the IP area.

Currently, i.e. before the implementation of the investment proposal, the numbers and species diversity of bats are considered consistent with the available natural resources, more precisely: the variety of microhabitats and food base.

The lack of suitable daily shelters in the region, more precisely: the large area of coniferous vegetation, the practical absence of rock crowns and so on is the key factor for the low diversity of species in the area of the IP.

Besides the abovementioned species, six other bat species which are not subject to Annex II of Directive 92/43/EEC were also registered, more precisely: Serotine bat (*Eptesicus serotinus*), Common noctule (*Nyctalus noctula*), Daubenton's bat (*Myotis daubentonii*), Soprano Pipistrelle (*Pipistrellus pygmaeus*), Savi's Pipistrelle (*Hypsugo savii*) and Long-eared bat (*Plecotus sp.*).

#### 4.6.1. Conclusions about the impacts on bats

During the implementation of the investment proposal the following impacts can be expected:

- ✦ Direct destruction of habitats and shelters: this impact will affect mostly the Greater Horseshoe bat (*Rhinolophus ferrumequinum*). During the development of the open pit will be destroyed the species' underground summer shelter.
- ✦ Interruption of the migratory corridor: not expected.
- ✦ The formation of permanent stockpiles (including during the initial reclamation period after closure of the pit's operations) will weaken the characteristics of these habitats in the respect their nutrient potential, closely linked with the change in the qualitative and quantitative characteristics of insect presence, which are an important food base for the bats. Presently, these territories represent insignificant part of the nutrient areas of the established bats (0.037 percent of the total are of PZ "Eastern Rhodope").



- The expected fragmentation of bat habitats will be negligible, given the limited area of the IP and the large number and variety of favorable habitats and shelters for bats in the protected zone.
- Given the extremely low frequency of occurrence of three of the four bat species established in the area of the IP, the overall impact on them within the protected zone BG0001032 Eastern

### **Fragmentation**

The characteristics of the IP affect shelters of four from the established bat species and the disturbance over the habitats potential, protection object in PZ and in the same time in significance as nutrient base for the bats, are insignificant. There are no migration routes affected by IP. For these reasons, fragmentations of the PZ and barrier effect of the facilities are not expected.

### **Disturbance of species**

The IP territory is far from the known shelters of big bat colonies in PZ "Eastern Rhodope" and in practice it does not impact on their entity and specific characteristics.

### ***Distortion of the species composition***

The IP implementation will not impact on the bat species composition in PZ "Eastern Rhodope" as well as in neighbor territories outside the NATURA 2000 network, in view of the fact that none shelters will be upset (except of the Greater Horseshoe bat, which is located in the IP area, but with insignificant number of only 8-10 specimens), none individuals will be destroyed, none migration passages will be interrupted. The impact on the nutrient habitats will be insignificant within strength, as well as within relative area of the affected habitats in relation to the area of the Protected zone (0.037 percent).

### ***Influence over FCS of the bats***

1304 Rhinolophus ferrumequinum (Greater Horseshoe bat):

- Established number of shelters – 1, ancient Thracian mine pit;
- Hibernate places – not determined;
- Number in reproduction places – around 8-10 specimens;
- Area of favorable habitats – 81 ha or 0.037 percent of the PZ "Eastern Rhodope" area;
- Area of proper hunting habitats – 81 ha or 0.037 percent of the PZ "Eastern Rhodope" area;

**Conclusion:** The IP influence on FCS is expressed by destruction of underground habitat of 8-10 specimens. None mortality of individuals is expected. None structural and functional parameters on population level will be violated.

1321 Myotis emarginatus (Geoffroy's bat)

In practice there will not be any impact on FCS of the specie. Its presence here is accident and the IP territory has limited are and significance for feeding its population in the Protected Zone.

Through the similar specifications in the behaviour and biology of the three species below, our conclusions are summarized.

1324 Myotis myotis

1307 Myotis blythii

1310 Miniopterus schreibersii

- Their shelters on the territory of the IP are not discovered. Their presence is linked with nutrient activity only;
- Area of favourable habitats, affected by the realisation of the IP – 81 ha or 0.037 percent of the PZ "Eastern Rhodope" area; the territory is used by single flying species only by the time of hunting activity;

**Conclusion;** structural and functional parameters on population level are not violated.

Except the above mentioned species, another six species of bats were registered. They are not an object of Annex II of Directive 92/43/EEC and are listed as: Eptesicus serotinus, Nyctalus noctula, Myotis daubentonii, Pipistrellus pygmaeus, Hypsugo savii and Plecotus sp.



The natural protection statuses of the established species of bats, included in Annex II of Directive 92/43/EEC are presented on Table 33.

**Table 33. Natural protection status of bats, established on the IP territory**

Registered species	IUCN	EUROBATS	DIR 92/43	BONN	BERN	BA	RB
<i>Rhinolophidae</i>		+					
<i>Rhinolophus ferrumequinum</i>	LR/nt	+	II,IV	+	II	2,3	-
<i>Vespertilionidae</i>							
<i>Myotis blythii</i>	-	+	II,IV	+	II	2,3	-
<i>Myotis myotis</i>	LR/nt	+	II,IV	+	II	2,3	-
<i>(Myotis emarginatus</i>	VU	+	II,IV	Ann II	II	2,3	+ rare
<i>Miniopterus schreibersii</i>	LR/nt	+	II,IV	+	II	2,3	-

List abbreviations in the table:

IUCN: Red List of Threatened Species, IUCN 2000

EUROBATS: The Agreement on the Conservation of Populations of European Bats

DIR 92/43: Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Annex II, Annex IV)

BONN: Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)

BERN: Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention, Annex II)

BA: Biodiversity Act

RB: Red list of Republic of Bulgaria, 1985

#### 4.7. Impact assessment of the investment proposal's implementation and the development of alternative sites on other mammals.

Data collected to date for the habitats /species.

**Wolves** (*Canis lupus* L.) The assessment of the Ada Tepe region shows low habitat suitability, as the monoculture forest of black pine has low productivity levels and does not provide an adequate level of plant diversity to ensure a good nutritional basis for potential prey. Traces indicating the presence of wolves were not found. Their food base in the area is in a poor state. Questionnaires completed by local inhabitants showed no attacks on domestic animals – a typical conflict in areas where there is free range grazing of domestic animals and the lack of an adequate natural food base, as is the case in the region. The habitat provides good conditions for shelter and movement of species between different locations where food may be found. In this type of habitat a low density of wolves is expected, few pack members – not more than 4 individuals in an area not less than 150 square kilometres.

The disturbances related to construction and mining activity will reduce the presence of animals included in the wolves' food chain. Based on the lack of data showing the presence of wolves in the area of the IP, the impact may be classified as insignificant. In this investment IP covers about 0,96 % of the territory of individual pack in alternative 1 and 0,13 % in alternative 2. Overall impact on wolves is insignificant.

**Brown bear** (*Ursus arctos* L.): The habitat in the zone of the Eastern Rhodope, has been evaluated as a potential temporary biotope for brown bears in the Central Rhodope, migrating East. The area of Ada Tepe does not offer a food base substantial enough to feed specimens of the species and the area can only provide temporary shelter during their movement. Traces, indicating the presence of brown bears, have not been found and there have been no eyewitnesses or information related to sightings in more than 10 years. In comparing the suitability of the bear habitat in the region of the investment plan with the model designed for the "National Action Plan to Protect the Brown Bear in Bulgaria", the habitats in the region are classified as grade three to grade six, which means they are slightly to completely unsuitable (Class 1 and 2 are optimal).

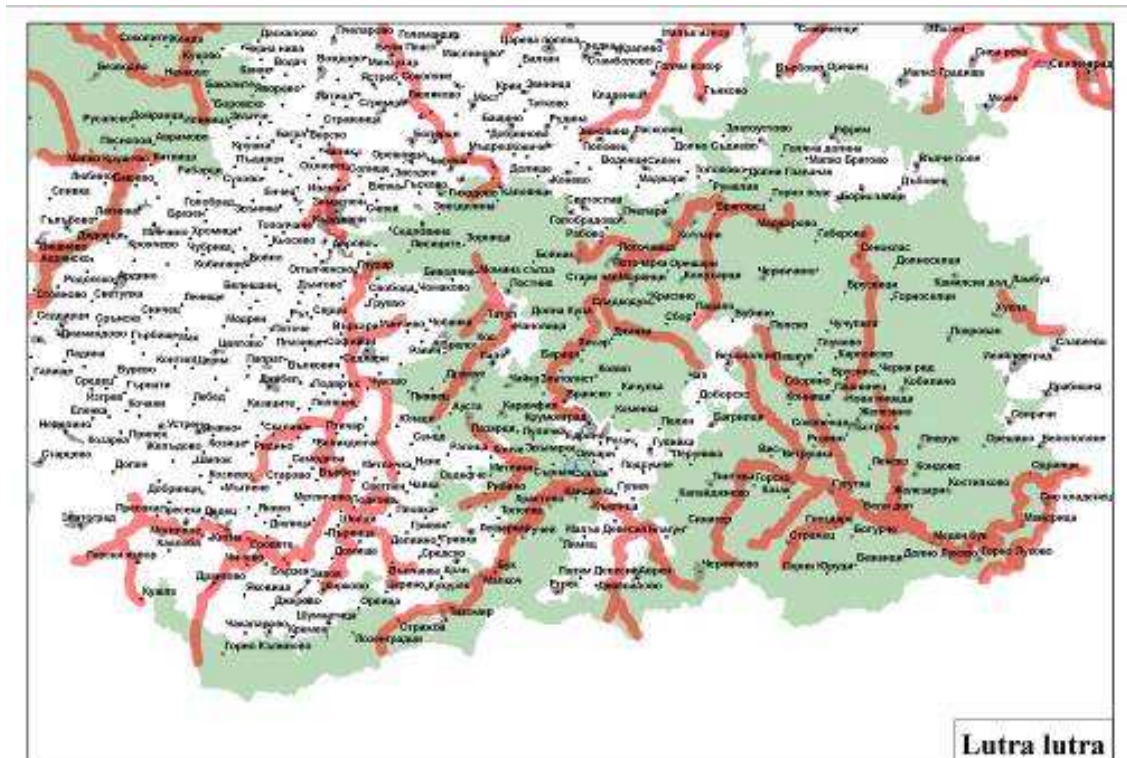
**Otter (*Lutra lutra*):** There is interest in using the Kaldzhik River Gully, as the area to be partitioned and closed with the objective to construct a tailing dam in alternative 2. This is one of the most sensitive areas. The river has a pronounced seasonal water system and much of the system dries up during hot summer months. Transects along the gully show the formation of permanent pools along the course of the riverbed and in the lower sections, before the confluence with the Krumovitsa River, there is almost continuous and uninterrupted water flow. The pools and water areas are most often inhabited by the ordinary frog (*Rana ridibunda*) and several species of fish, which represent an ideal food base for the otter. Downstream along the river, traces of otter activity in the form of excrement, containing the bones of frogs and occasionally fish scales and bones, were found and marked with GPS. Obviously the gully of the river is a place the otter uses for feeding and shelter. Given the length of the stream and the seasonal water flow, it is likely that this region is used by no more than one specimen, whose primary area is the Krumovitsa River.

The geographical characteristics in the region predispose effusion of waste waters from the mine in Krumovitsa river. In extraction by flotation the chemical compounds are less toxic and in case of pouring them to the river, the concentrations will not be lethal. Nevertheless control on the acidity of the underground water and waters, which are discharged before and after the waste storehouse is recommended. Addition of reagents for controlling the pH level is also recommended. The potential impact is not subject to an accurate assessment.

Due to alternative 2 geographic characteristic of the region predispose to effusion of waste water from mine site to the Krumovitsa river in case of accidents in Kaldzhik River and then to krumovitsa river. The assessment of potential impact based on mean individual territory of otter shows decline on otter population 51,16 km along the rivers Arda nad Krumovitsa. Assessment of whole protected zone Eastern Rhodope shows that suitable places for otter are 357,96 km along the river. The potential impact could affect 14% of the population in the area.

In regular operation of the mine significant impact is not expected.

**Fig.3. Distribution of the otter in the area**



**Marbelled polecat (*Vormela peregusna*).**

During the field work in the area of the investment proposal no found evidence or traces of the presence of species were found. The area of Kaldzhik Gully offers potentially suitable habitat for the species, but its presence is not documented.

**Mouse-tailed Dormouse (*Myomimus roachi*)**



In the IP area there is no suitable habitat for the Mouse-tailed Dormouse or typical ones. No data on reported finding dead or individuals.

**European Ground Squirrel (*Spermophilus citellus*):** In the IP area and the surroundings no presence of the species was established. Therefore, the potential impact may not be assessed. In intensive grazing, Kaldzhik Gulley represents a suitable habitat for a small Ground Squirrel colony.

**On national level the expected impact for the above mentioned species of mammals is expected to be minimum. Regarding the species in the zone, there will not be any direct lost of habitats and significant indirect impacts. Loss of habitats is below 1 percent towards Eastern Rhodope zone and it is insignificant, referred to national mammals populations.**

#### 4.8. Expected impacts on bird species subject to conservation in the protected zone BG 0002012 Krumovitsa.

##### 4.8.1. Birds occurring in the area of investment proposal, subject to conservation in the protected zone BG 0002012 Krumovitsa and expected impact thereon.

###### **Species of Annex I of Directive 79/409/EEC (Annex 2 of the LBD):**

**Black Stork (*Ciconia nigra*).** The black stork nests in the territory of protected zone Krumovitsa BG 0002012. The density of population is estimated at 10 couples nesting in rock wreaths in the area. Since the species feed on fish, it feeds mainly along the valley of the Krumovitsa River and its tributaries. In the area of the investment proposal, the species occurs mainly around the right tributary (river Kesebir) of Krumovitsa River. No nests were established in the area of the proposal due to the lack of suitable habitat. Black storks feed mainly in Krumovitsa River, south of Ada Tepe (2-4 individuals), but the right tributary is also used as food habitat of 1-3 individuals. Black storks regularly use air currents over Ada Tepe to raise height. Impact on the species will be insignificant.

**Table 34. Assessment of types of negative impacts and affected parameters and criteria - Black Stork**

Impact type	Habitat destruction	Fragmentation	Disturbance	Deterioration of the quality of habitats		
				Disturbance	Waste Water	Waste
Parameter						
Habitat's area	-	-	-	-	-	-
Habitat's integrity	-	-	-	-	-	-
Nesting substrates	-	-	-	-	-	-
Food biotopes	-	-	-	+	+	+
Rest places	-	-	-	-	-	-
Population numbers	-	-	-	+	+	+
Population-breeding	-	-	-	-	-	-
Biological corridor function	-	-	-	-	-	-
Geographical connectivity	-	-	-	-	-	-

Legend: + - has a negative impact - - no negative impact

**Short-toed Eagle (*Circaetus galicus* ).**The Short-toed eagle nests in protected area Krumovitsa BG 0002012, 2 couples have been found. In the area of investment proposal, the species is established as nesting during the monitoring conducted during 2005-2006 years. In 2005 nesting territory of 1 couple was established on the South-eastern slopes of Ada Tepe, and in 2006 the species did not nest there. South-western slopes of Ada Tepe represent a suitable nesting habitat, despite the fact that species has not nested there in 2006, 2007 and 2008. The open terrains are suitable food habitat for the species.

**Table 35. Assessment of type of negative impacts and affected parameters and criteria – Short-toed eagle**

Impact type	Habitat destruction	Fragmentation	Disturbance	Deterioration of the quality of habitats
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Parameter				Disturbance	Waste Water	Waste
Habitat's area	+	+	-	-	-	-
Habitat's integrity	-	-	-	-	-	-
Nesting substrates	+	-	+	+	-	-
Food biotopes	+	-	+	+	=	+
Rest places	-	-	-	-	-	-
Population numbers	-	-	-	-	=	=
Population-breeding	+	-	+	+	=	+
Biological corridor function	-	-	-	-	-	-
Geographical connectivity	-	-	-	-	-	-

Legend: + - has a negative impact - - no negative impact

**Black Kite** (*Milvus migrans*). The type is established as reproducing in the protected zone BG0002012 Krumovitsa - 1 couple. During the years 2005-2006, the monitoring did not establish the species in the area of the proposal, but field studies in 2008 established a specimen flying high over the Eastern slopes of Ada Tepe. The IP is not expected to have a direct negative impact on the species due to its low number in the region of the gold mine and its sporadic occurrence.

**European Roller** (*Coracias garrulous*) is subject to protection as a nesting species in protected zone BG 0002012 Krumovitsa and is found nesting in the area of the proposal. Since the 1 nesting couple found in the area of investment proposal is outside the planned infrastructure activities, the expected impact on the species is minimal.

**European Nightjar** / *Caprimulgus europaeus* / is the subject to conservation in the protected zone BG 0002012 Krumovitsa as nesting species and is found nesting in the area of the proposal. One nest was established in Eastern slopes of Ada Tepe during monitoring in 2005-2006. During field studies in 2008 it was not established. Negative impact on the species is expected to be low.

**Barred Warbler** (*Sylvia nisoria*) inhabits shrub communities, non-dense groups of trees with many shrubs in the open spaces and pastures in the area of Ada Tepe. Significant impact is not expected.

**Red-backed shrike** (*Lanius collurio*), as with the previous species, inhabits shrub communities, non-dense groups of trees with many shrubs in the open spaces and pastures in the area of Ada Tepe and Krumovitsa River valley. Significant impact is not expected.

Typical bird species in the territory of IP not included Annex I of Directive 79/409/EEC

1. Buteo buteo
2. Accipiter gentilis
3. Falco tinnunculus
4. Athene noctua
5. Otus scops
6. Strix aluco
7. Columba palumbus
8. Streptopelia turtur
9. Streptopelia decaocto
10. Perdix perdix
11. Merops apiaster
12. Apus apus
13. Hirundo rustica
14. Hirundo daurica
15. Delichon urbica
16. Muscicapa striata
17. Sylvia atricapilla



18. *Sylvia communis*
19. *Erithacus rubecula*
20. *Luscinia megarinchos*
21. *Oenanthe oenanthe*
22. *Troglodytes troglodytes*
23. *Turdus merula*
24. *Sitta europaea*
25. *Alauda arvensis*
26. *Motacilla alba*
27. *Motacilla flava*
28. *Parus major*
29. *Parus caeruleus*
30. *Parus lugubris*
31. *Emberiza citrinella*
32. *Emberiza cirrus*
33. *Emberiza cia*
34. *Fringilla coelebs*
35. *Pyrrhula pyrrhula*
36. *Loxia curvirostra*
37. *Carduelis chloris*
38. *Carduelis carduelis*
39. *Acanthis cannabina*
40. *Passer domesticus*
41. *Passer montanus*
42. *Passer hispaniolensis*
43. *Sturnus vulgaris*
44. *Oriolus oriolus*
45. *Pica pica*
46. *Garrulus glandarius*
47. *Corvus cornix*
48. *Corvus corax*

There is no significant impact on 48 typical bird species mentioned above by optimizing the positioning of the elements of the IP.

Impact on national level for all species is insignificant.

#### **4.9. General analysis of expected impacts of the IP in terms of continuity, structure and functions of protected zone.**

General conclusion of this Assessment is that comparatively small territory (approx. 85 ha) or 0.04 % of the total area of the protected zone which is affected, closeness to anthropogenic landscapes (urbanized areas, fields, grazing grounds, forest plantations, etc.) determines comparatively small number of habitats and species, that will be affected by the IP.

The expected effects are low due to in detail research of all alternatives and optimizing the technologies and elements of the IP both spatially and temporally.

Alternative 1 of IP offers the lowest possible impact on the elements of the protected zone and this is conclusion of 2 years research and dialogue between investor and the team prepared the Assessment.





By changing the underlying technology for production of gold from Dore to the production of gold concentrate without cyanides as general reagent reduces significantly the possible potential impact both on local level and zone. Moreover, there is no need to build a tailing pond in Kaldzhik Gully which in itself would undermine and destroy habitats, such as habitats of the two tortoises species and several bird species of Annex I of Directive 79/409/EEC.

From the detailed assessment of the IP and in particular considered Alternative 1, it can be concluded that the integrity of the protected zone will not be affected, and its structure and functions will remain unchanged.

In case of Alternative 1 the only impact is expected to be indirect on habitats 5210, 6220, 6510, 91M0 and 92D0. There is no expected direct or indirect impact on all other habitats. Nationally expected impact on habitats 6510; 6220; 91M0 and 92D0 also be insignificant.

In terms of invertebrate fauna in the implementation of Alternative 1 is expected to be affected during construction and operation – 1) insignificant on zone level for population and habitats of *Calimorpha quadripunctaria* (zone: the loss of habitats – 0.56 % Alternative 1); 2) insignificant in zone level (between 0.01 and 0.03 %) for habitats and population of *Cerambyx cerdo* and *Lucanus cervus*. For all other species there is no direct or indirect impact on the zone. For all invertebrates nationally impact is disparaging insignificant.

In terms of fish fauna in the implementation of Alternative 1 and normal, trouble-free operation is not expected to be any significant negative impact on the object and purposes of PZ "Rhodopes – Eastern" Indeed for these species both at zone and national level are not expected negative impact.

In case of amphibians and reptiles there is negative impact on both two species. Referred to the entire protected zone the impact on habitats is within 0.045 % - 0.063 %. Levels of impact is soncidered as acceptable. The influence on habitats referred to whole Natura 2000 system in the country is logically much more insignificant.

For four species of bats found in the area of IP and other mammalian species subject to protection expected negative impact is much less than 1 % at zone level and it is assumed as insignificant. At national level is thus even lower.

The same is valid for bird species of Annex I of Directive 79/409/EEC as well as typical bird species.

We can also say that IP and in particular Alternative 1 does not affect the structure and functions of the zone because there is no fragmentation of habitats and it is not expected to affect bio-corridors.



## 5. Assessment of the possible mitigation activities and their effectiveness regarding the prevention or the avoidance of significant adverse impacts.

**Given the nature and scope of the investment proposal, complex mitigation activities can be planned for the habitats and the species, which will be affected by the investment proposal in the potential Site of Community Importance (pace) - "Eastern Rhodope" BG0001032.**

During the implementation of the investment proposal, provided there is a halt of other investment proposals of a similar type, it is necessary to implement the following mitigation measures:

### 5.1. Habitats

1. In the reclamation of the pit the introduction into the PZ of foreign plant and animal species must be prevented, to reclaim with representatives of the local flora (if possible).

*Expected impact:*

- ✦ Reduction of the risk of accidents and restriction of the influx of invasive or foreign species in all habitats in the PZ.
- ✦ Prevention of potential damage to the food base and on the structure of the habitats of the protected species.

2. No use of the rivers as a water source

*Expected impact:* Avoid habitat drought

3. The protected zone Eastern Rhodope BG0001032 to be marked off with special signs and information boards, displaying the object and purpose of the zone, and the restrictive regime applicable in the zone.

*Expected impact:* The people in the region to comply with the restrictive regimes correctly and fully.

4. During the operation, the traffic to follow predetermined routes with clear and permanent markings. The traffic of equipment outside the roads and the approaches to building spots in the area should not be allowed.

*Expected impact:*

- ✦ Prevention of further destruction of vegetation in the areas of equipment traffic.
- ✦ Reduction of the disturbance caused by the movement of people and equipment.

5. No other investment proposals for ore extraction to be allowed on the territory of Krumovgrad municipality, affecting habitats and species subject to conservation within the zone, or which are in the zone itself or within a radius of less than 100 meters from its boundaries, in the defined impact area, which impact might have a cumulative and synergic effect with the determined impacts of this proposal.

*Expected impact:* Removal of the cumulative impact that would be caused by the increase of the anthropogenic stress over the Eastern Rhodope zone and prevention of any further negative impacts on habitats and species in the zone.

Mitigating measures discussed should be implemented as package rather than selectively. This type of mitigation measures should be imperative for all investment proposals that are similar and suggest similar impacts that could be implemented without adverse effect on the conservation of PZ.

### 5.2. Invertebrates

Given the nature and scope of the investment proposal and the planned production and technological structures, at this stage there are no and cannot be planned any complex mitigation measures for the species *Callimorpha (Euplagia) quadripunctaria* and *Probatiscus subrugosus* and their habitats, which



would be severely impacted by the investment proposal in the potential Site of Community Importance (pSCIs) - Eastern Rhodope BG0001032.

During the implementation of the investment proposal, provided it is combined with halt of other investment proposals of a similar type in the zone, it is necessary to implement the following mitigation measures, which should be implemented as a package and not selectively, for the species *Cerambyx cerdo* and *Lucanus cervus*:

1. During construction, to be reduced to a minimum the removal of old and rotting hollow deciduous trees, their stumps and fallen trunks. It is obligatory to keep some of the trunks and the stumps of the cut oak trees in the forest habitats impacted by the IP and those near them.

*Expected impact:* Conservation and preservation of the appropriate substrates needed for feeding and development of larvae of *Cerambyx cerdo* and *Lucanus cervus*.

2. No clear cutting of the oak arrays located to North of Ada Tepe and below the open pit, and also the arrays near the low-grade ore stockpile, plus restriction of the area of the latter in its South-eastern part, which overlaps a part of habitat 91M0 (Pannonian-Balkan turkey oak-sessile oak forests).

*Expected impact:* Removal of direct impact on habitat 91M0 (Pannonian-Balkan turkey oak-sessile oak forests) and the resulting indirect impact on the appropriate substrates for feeding and development of larvae of *Cerambyx cerdo* and *Lucanus cervus*.

3. During the construction to be reduced to a minimum: the removal of surface layer of the soil, the removal of ecotone ecosystems (on the borders between forest and mountain, or plain and slope) and the clearance of areas with herbaceous and bush vegetation.

*Expected impact:* Conservation and preservation of the integrity of the food habitats and shelters of invertebrates.

4. De-dusting of the production cycle, especially of transport activities in the newly built unpaved roads and prevention of the contamination of roads with oil, fuel and hazardous substances.

*Expected impact:* Conservation of the trophic base and the plant-feeding insects (imago and larvae).

5. Carry out blasting activities only in the light part of the day.

*Expected impact:* Reduce the disturbance of the night-active invertebrate species.

6. Sodium-vapour lamps should be used (they emit light mostly in the red and yellow parts of the spectrum), which have significantly lower attraction effect on nocturnal insects, compared to the mercury-fluorescent lamps, which emit significant amount of blue and ultraviolet rays. In addition, the number of lamps should be limited to 2 per ha.

*Expected impact:* Reduction of the highly attractive effect of lamps emitting rays from the short-wave part of the spectrum, which cause disorientation of nocturnal insects and their quick death.

7. Compliance with fire safety rules and ban on the burning of vegetation.

*Expected impact:* Prevention of temporary destruction of habitats, including the substrates for development and the trophic base for invertebrate species subject to protection.

8. Prevention of fuel and lubricants spills from the construction machinery during the construction and the operation of the facility.

*Expected impact:* Local prevention of soil and water contamination within the boundaries of the region and the protected zone and prevention of the resulting deterioration of the food base and the qualities of the habitats of the species, subject of protection.

9. During the reclamation of the mine the introduction of foreign plant and animal species to the zone should be prevented, it should be reclaimed with local flora if possible.



*Expected impact:* Reduction of the risk of introduction of invasive foreign species in all habitats in the zone. Prevention of possible damage to the food base and structure of the habitats of the species, subject to protection.

10. Placing of special information boards describing the purposes and conservation objectives of the protected zone.

*Expected impact:* Full and correct compliance of the local people with the restrictive regimes.

11. Instruct staff on the application of the mitigating measures during the construction and the preparatory stages, as well as at the later stages - the staff responsible for the operation and the maintenance of the facilities and the infrastructure in the area of the IP.

*Expected impact:* Correct and complete implementation of the mitigating measures and awareness of the nature conservation activities.

12. During the construction and the operation stages, the traffic of people and equipment to follow only predetermined routes and to be prevented the traffic outside the roads and the approaches to building spots and production areas in the zone.

*Expected impact:* Reduction of further devastation of vegetation, reduction of the disturbance of the animals and of their mortality, and also reduction of further deterioration and diminishing of their trophic base.

### 5.3. Ichthyofauna

The underground and infiltrated water whole territory of mine, which will be collected and directed to the collecting shaft must not be discharged in Kaldzhik Gully, rather it must be returned for turnover use.

*Expected impact:* The danger of contamination of the rivers Krumovitsa with chemicals will be avoided; also avoided will be intoxication of the ichthyofauna, including the species subject to protection in the protected zone (Maritsa Barble and Balkan Loach)

### 5.4. Reptiles and amphibians

The following mitigation measures can be implemented during the various stages of the IP:

1. Construction: At least one year before the implementation of the IP should start the relocation of the tortoises inhabiting the area and their repopulation at suitable habitats, sufficiently far from the IP. For these activities to be effective, a fence should be built which will prevent the repopulation by tortoises. The relocation of all animals must be finished before the beginning of the construction.

2. Operation: During this stage it is obligatory to keep in good condition the fences built in the previous stage. Continuous monitoring on the populations of both species of tortoises is necessary, and adequate measures to reduce the negative impact should be taken, if needed.

3. Reclamation: Full restoration of the habitats of tortoises, where this is possible, is a complex task which might take more than 10 years and which would require solid financial resources.

### 5.5. Mammals

1. During the construction stage the hollow and old trees should not be removed without reason.

*Estimated impact:* Conservation and preservation of existing daily shelters of bats.

2. De-dusting the production cycle, especially transport activities on the newly built unpaved secondary roads.

*Estimated impact:* Conservation of insect numbers and variety.

3. Avoid the clearance of areas with herbaceous and shrub vegetation.

*Estimated impact:* Preserving the integrity of the food habitats of bats.



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4. Prevent the extraction of inert materials needed for the construction of the facilities of the IP from new extraction pits on the river bed of Krumovitsa River.

*Estimated impact:* Conservation of important food habitat for bats and a source of great abundance of aquatic insects.

5. Carry out blasting activities only in the light parts of the day.

*Estimated impact:* Reduce the disturbance of bats.

Given the nature and scope of the investment proposal and the planned production and technological structures, no complex mitigation measures can be planned for the other mammal species, subject of protection in potential Site of Community Importance (pSCIs) - Eastern Rhodope BG0001032.

**The mitigating measures discussed above should be applied in a package and not selectively. These mitigation measures should be applied for all investment proposals which are of a similar type, which assume similar adverse impacts and the implementation of which (including their cumulative impact) has been assessed to not contravene the conservation objectives of the PZ and of other protected territories under the Law on Protected Territories.**

### **5.6. Compensatory measures**

The team prepared the Assessment don't propose any compensatory measures cause it is required only in cases of proved significant impact on protected zone. In this case there are no such circumstances.



## 6. Evaluation of possible alternatives and their effectiveness on preventing or avoiding significant negative impacts, including Zero Alternative

### 6.1. Description of Alternatives

The investment proposal (IP) does not provide alternative sites for construction of the mine, but only alternative deposits that can be developed independently or together with the development of Ada Tepe.

#### 6.1.1. Zero alternative

Under Section 8 of the additional provisions of the Ordinance for Assessing the Compatibility of Plans and Programmes for the Conservation of Protected Areas, "Zero Alternative" is a description of the current situation and the consequences of this when the proposed investment plans cannot be implemented. **The Zero Alternative is consistent with the objectives of preserving the protected area.** Zero Alternative does mean that there will be no negative impact on the objectives of the protected zone. Due to the depopulation of the villages and neighbourhoods around the town of Krumovgrad, a continued reduction in the intensity of the anthropogenic influence on the habitat, flora and fauna of the area can be expected. This will lead to the restoration of natural and semi-natural vegetation, with varying degrees of intensity in different regions. Therefore, Zero Alternative is the most suitable option for the objectives and goals of the protected zone.

#### 6.1.2. Investment Proposal - Alternative 1.

The total area provided for this alternative is 85 ha (from 165 ha – Alternative 2). Except for mine site, which is with no other alternative, all other elements are placed in the best way to minimize the impact on protected zone. Even the area for separate elements is reduced to operational minimum. Also this alternative has the most compact positioning which minimizes cumulative impact of the elements.

**Proceeding from the assumption above Investment Proposal is compatible with conservation objectives of the protected zone.** For habitats 5210, 6220, and 6510 there will be an insignificant negative impact at the local level.

With regards to invertebrates, more specifically *Callimorpha (Euplagia) quadripunctaria*, the loss of habitat area in the zone would be 0.56%. On local level this loss is significant – more than 1%

In case of *Cerambyx cerdo* assessment shows that implementation of IP in all alternatives the loss of habitats on zone level will be insignificant – 0,01 to 0,03 %.

In case of *Lucanus cervus* assessment shows that implementation of IP in all alternatives the loss of habitats on zone level will be insignificant – 0,01 to 0,03 %.

For the fish species *Barbus cyclolepis (Barbus plebejus)* and *Sabanejewia balcanica (Sabanejewia aurata)* (Balkan loach), there will no impact at the zone level.

With regards to amphibians and reptiles, more specifically *Testudo hermani* and *Testudo graeca*, the IP will affect a respective 0.093% and 0.19% of both populations in the protected zone. On the whole PZ the impact and loss of habitat is in between 0,048 – 0,063 %.

The implementation of IP will not be affect species composition of bats in PZ Eastern Rhodope as well as neighborhood territories outside of Natura 2000 network, cause their shelters will be preserved, no individuals will be destroyed, no migratory corridors will be affected. The impact on food sources is low in both magnitude and in relative size of the affected habitat to the area of protected zone – 0.037 %.

As for the other mammal species in the area there is no direct loss of habitats and significant indirect effects. Habitat loss is less than 1 % on zone level and insignificant on national level.

Implementation of IP will not have impact on birds on PZ Eastern Rhodope and PZ Krumovitsa.

Overall the impact on zone level is insignificant and in the standards. The same applies to the national network of protected zones as a whole.



### 6.1.3. Alternative Investment Proposal – Alternative 2

Cannot be implemented in view of the conservation objectives of the protected zone and the application of the currently in force Law on Biodiversity and Directive 92/43/EEC

## 6.2. Overall assessment of alternatives

**Table 36.** Overall assessment of alternatives

Alternatives	Habitats and species for which the impact remains significant, regardless of possible mitigation measures	Possible compensatory measures	Conclusions
Zero	None		Complies with the requirements of art. 6 Directive 92/43/EEC
Investment Proposal-Alternative 1	Insignificant impact on habitat loss on one habitat at zone and local level and indirect insignificant impact on 4 habitats.  Insignificant impact at zone level on 4 habitats at local level.  Insignificant impact at zone level on 3 invertebrates and 2 vertebrates' species.	Exist	Comply with the requirements of art. 6 Directive 92/43/EEC.
Investment Proposal-Alternative 2	Significant impact on habitat loss. Insignificant impact on habitat loss on 2 habitats at local level.  Indirect impact on 2 habitats	Exist	Does not comply with the requirements of art. 6 Directive 92/43/EEC



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## 7. Conclusion on the type and extent of the adverse impacts

### Alternatives, which can be developed:

#### 7.1. Zero alternative

Can be implemented in view of the conservation objectives of the protected zone and the application of the Law on Biodiversity and Directive 92/43/EEC. The zero alternative is the most recommendable for meeting the protected zone's conservation objectives and goals.

#### 7.2. Alternative 1

Can be implemented in view of the conservation objectives of the protected zone and the application of the currently in force Law on Biodiversity and Directive 92/43/EEC. This must be accomplished with following mandatory implementation of mitigation.

#### 7.3. Alternative 2

Cannot be implemented in view of the conservation objectives of the protected zone and the application of the currently in force Law on Biodiversity and Directive 92/43/EEC.





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## **8. Conclusion on the circumstances of art. 33 LBD and compensatory measures under Art. 34**

The investment proposal for the operation of the gold mine is not a circumstance under Art. 33 of the Law on Biodiversity i.e. existence of a primary public interest<sup>1</sup>.

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<sup>1</sup> Pursuant to item 32, para 1 of the Additional Provisions: "Primary public interest" is interest related to public health, national security, exceptionally positive impact on the environment, as well as specific public obligations with respect to transport, energy and communications systems.



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## **9. Used methods and methods of forecasting and impact assessment**

The compatibility assessment is based on detailed study of the existing literature on the flora and fauna in the Eastern Rhodope, combined with field studies conducted between April-September 2008. Every expert had 10 days for site visits.

The Eastern Rhodope has been studied in the period 2003-2006 during the implementation of the "Natura 2000" project of Green Balkans. Also used is data from standard Natura 2000 form, which are adjusted by a team of BAS, as well data from the Study of the Flora and Fauna in the Krumovgrad Gold Ore Mining Region, financed by the investor and conducted by a team of experts from the Forestry Technical University and Zoology Institute of BAS.



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