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Strategic Environmental Assessment (SEA): SEA for Regional and Spatial Plans: Selected case examples

Online Training Workshop on the Practical Application of Strategic Environmental Assessment (SEA)
in Regional and Spatial Planning

15 October 2021

Baku, Azerbaijan

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SEA Master Plan for City of Orhei (2014)

- Located in the centre of the Republic of Moldova, 45 km north from the capital Chisinau
- On the highway Chisinau-Balti, on the banks of the Raut River.
- City occupies 1402 ha
- The “owner” and the beneficiary of the Master Plan preparation project is the City Council Orhei
- Master Plan developed by the company ISC Land Support Systems, under the coordination of the Chief Architect of the city.



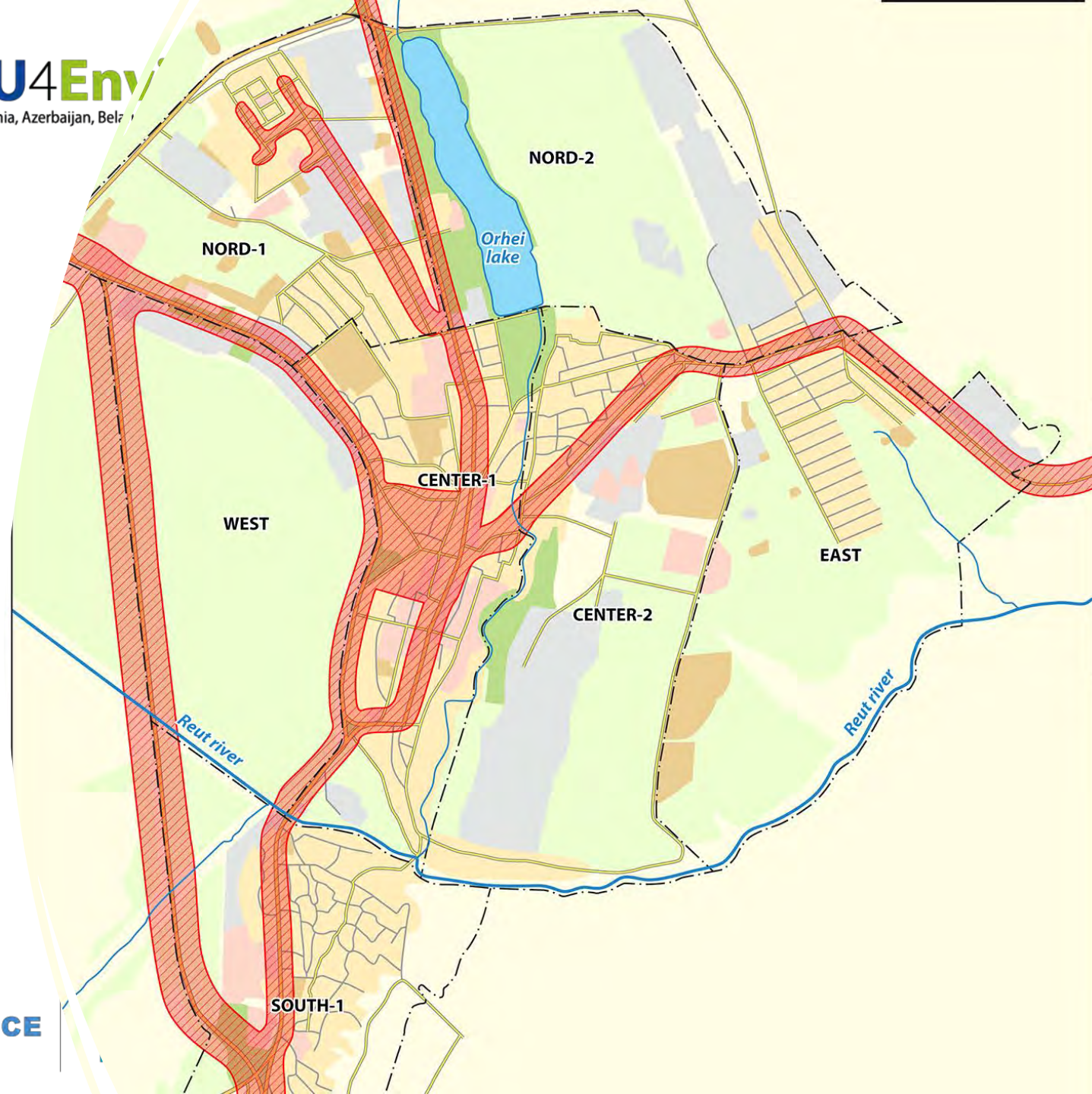


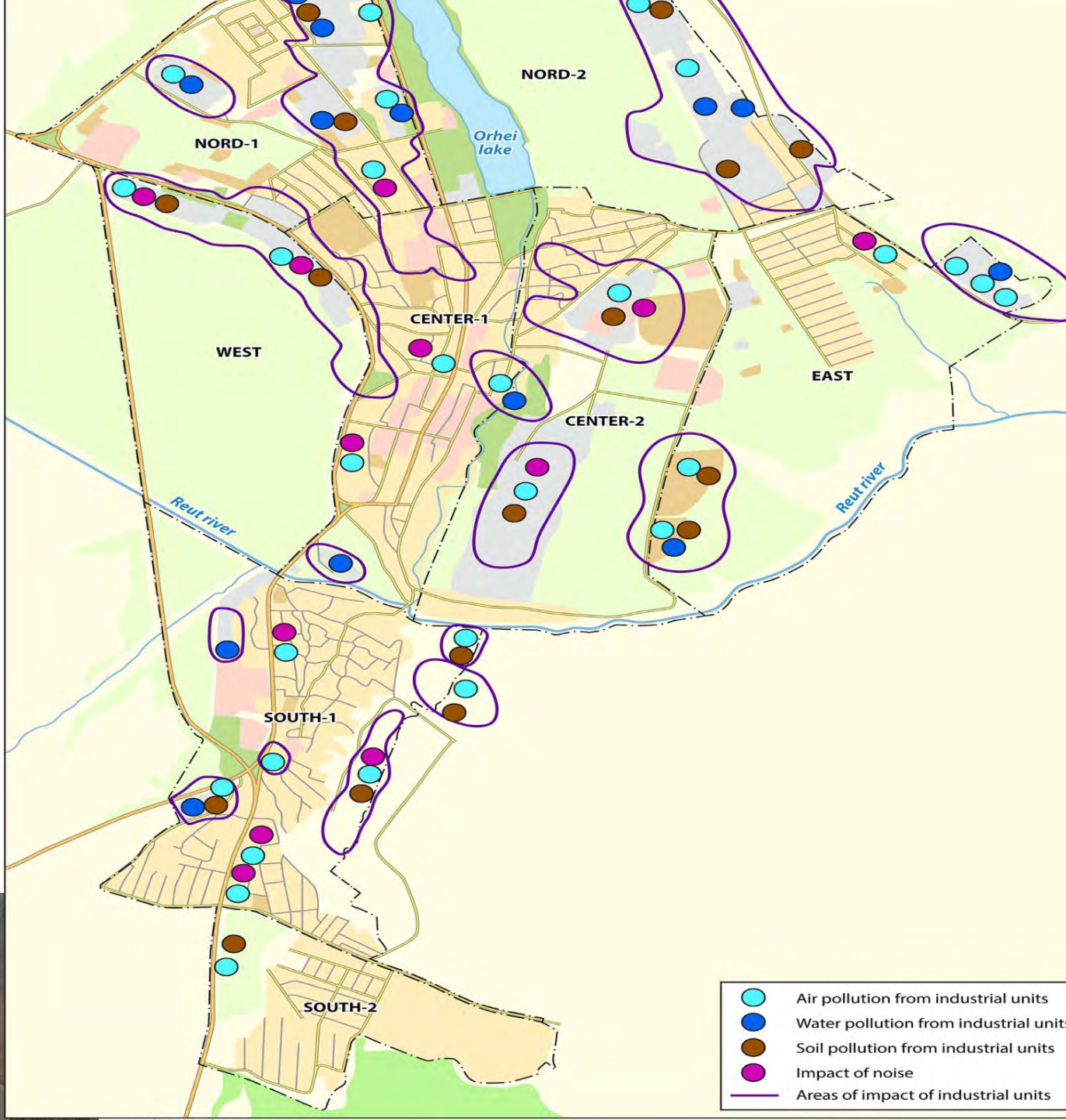
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SEA Scoping and Baseline analyses

- Key issues:
- Transport and industrial emissions
- Water resources and wastewater treatment
- Soil, erosion, active and old mining
- Waste management

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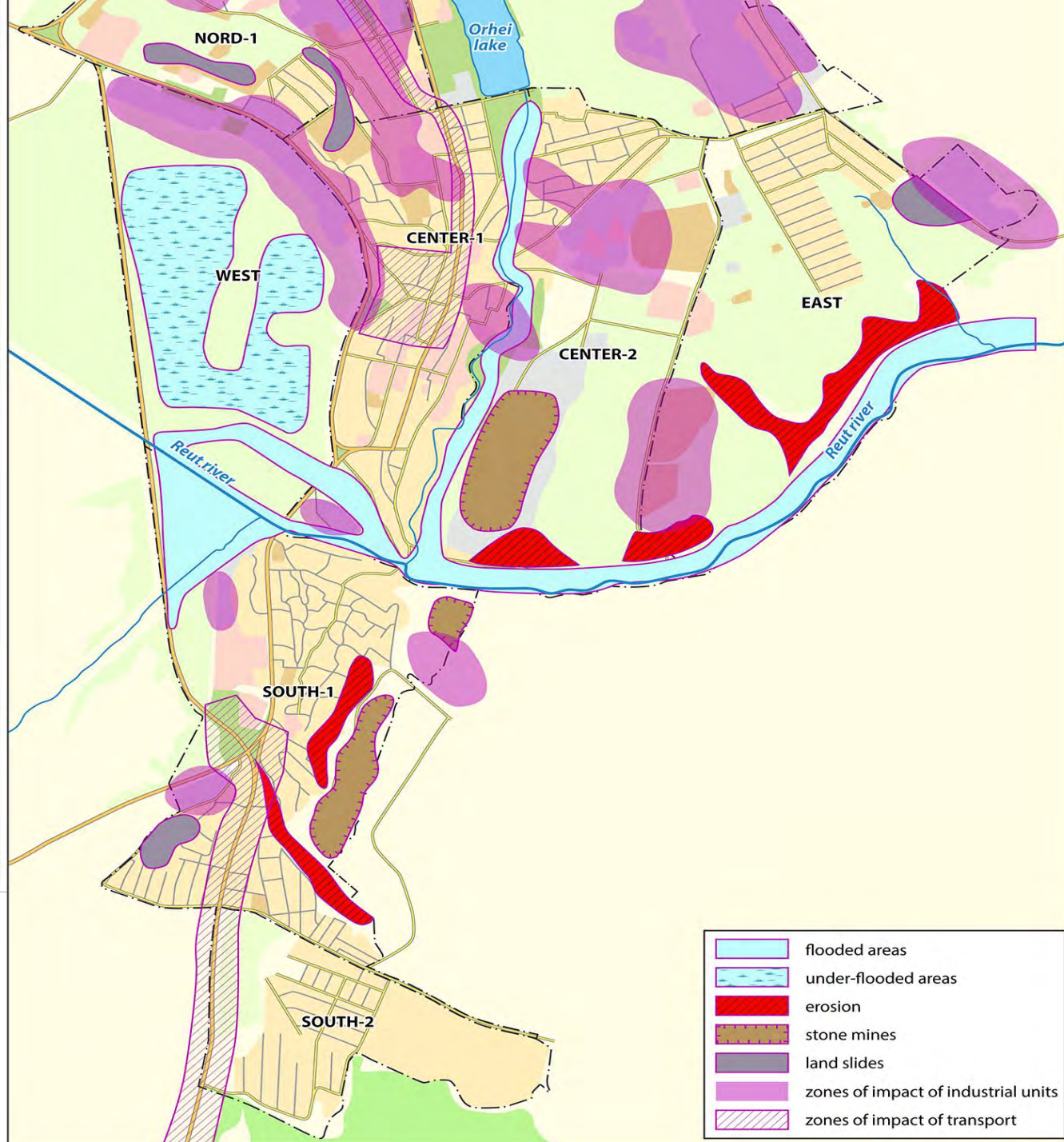
Old and new wastewater treatment facilities





Open stone quarries located directly in urban areas





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- Large areas of degraded land (mining, floods, landslides)
- Large areas with local air pollution and noise
- Nature protected areas in surrounding territory

=> Limited spatial development opportunities

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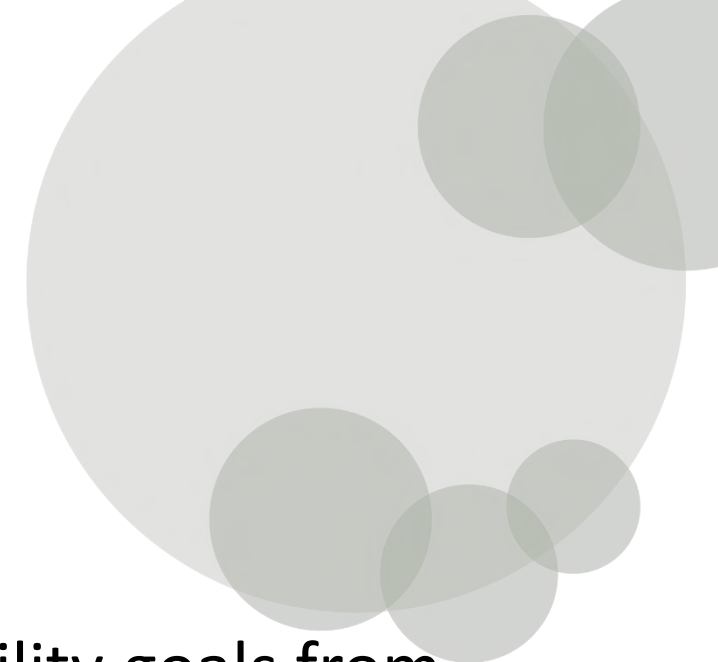
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SEA approach:

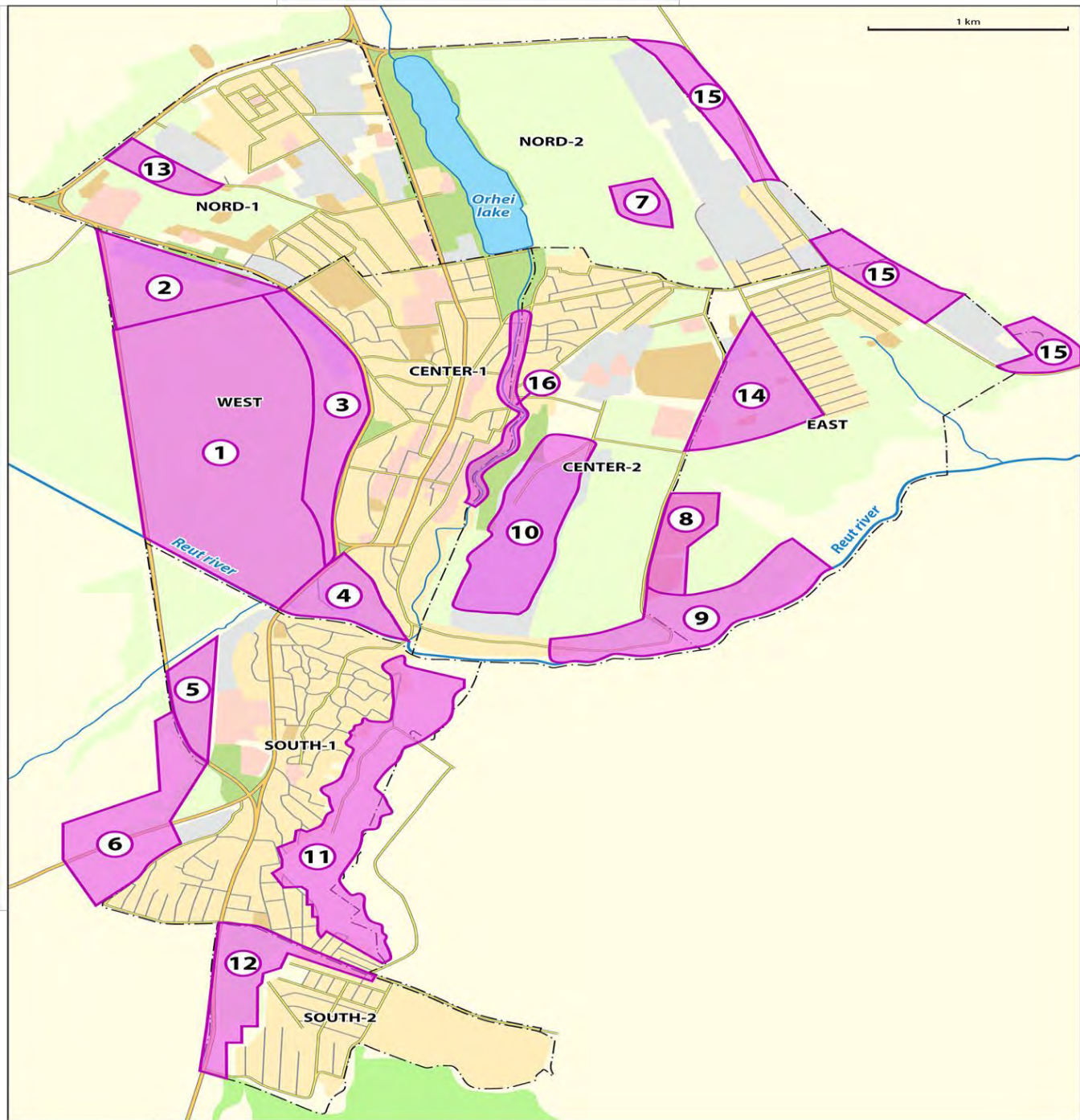
- Evaluation of Master Plan compliance with sustainability goals from national and local strategies
- Evaluation of proposed land-use changes on the environmental baseline
- Comparison of alternative proposals

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Objectives of the national strategic documents	Objectives of the Strategy for the social-economic development of the Orhei city for 2014-2020 (nr 13.20 from 27.12.2013) and other documents	Objectives, stated in the draft Orhei Master Plan	Level of formal compliance (+) full (+/-) partial (-) Non-compliance
Air			
Reduction of emissions of pollutants by 30% by 2023 and of greenhouse gases by at least 20% by 2020	<p>Ensuring protection of natural environment.</p> <p>Reduction of pollution of environment.</p> <p>Promotion of advanced technologies related to extraction of mineral resources</p>	Reduction of discharges of pollutants by means by closure of a number of enterprises, optimization of the transport schemes, development of territories and planning of trees and shrubs, and other measures	+ Complies
Enhancement of energy efficiency for the purpose of reducing by 2020 of energy consumption by 20%, achievement by 2020 of 20% of generation of energy from renewable energy sources, and 10% – from biofuel	<p>Reduction of consumption of energy for heating and use of buildings (thermal insulation, installation of solar panels).</p> <p>Reduction of losses of electricity at the expense of replacement of spiral tungsten filament lamps with light LED strip lamps.</p> <p>Capacity building for obtaining energy from alternative sources:</p> <ul style="list-style-type: none"> - use of wind potential; - acquisition and installation of solar panels 	These goals are not envisioned in the Master plan.	(-) Master Plan does not address any relevant issues



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- Evaluation of individual proposals for functional/land-use change

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Number and designation purpose of the territory	Name, designation purpose according to the Master Plan	Geographical location	Area, ha, m2	The share of agricultural lands	Potential Impact on key environmental components				Comments (arguments of the impact assessment, see table 6.2) (-2,-1,0,+1,+2,?)
					Air	Water	Soils	Biodiversity	
1 Reserved area used for agricultural purposes See Map VI.3 (below the table)	Complex zone for recreation, sport and tourism, including water bodies	The western part of the city	190	No	+1	+1	0	+1	0,+1
2 Partially industry, partially reserved area used for agricultural purposes Map VI.1	Mix zones for commercial, services and economic activities Non-poluting	The north-western part of the city	32	No	-1	0,-1	-1	0,-1	-1
3 Partially industry, partially reserved area used for agricultural purposes	Mix zones for living areas with commercial units and public services	The western part of the city	16	No	-1	0	0,-1	?	0,-1 RESIDENTIAL MULTISTOREY

Environmental factors

Air

Components of the Master Plan with potential negative impacts (-1,-2)

Potential cumulative impact (short description)

Proposed mitigation measures

Territory № 2

Mixt zones for commercial, services and economic activities

Non-poluting

(-1)

Emission of pollutants from transport and industrial units

Creation of a buffer green zone between the area 2 and the residential areas

Placement of the objects of the lowest category of sanitary risks only with BAT (Best Available Technology) pollution abatement technologies and equipment

Territory № 3

Mixed zones for living areas with commercial units and public services

(-1)

Pollution from power plants and transport

The heating system to be designed based on the results of the project-level environmental assessment (choice of technology and technical design – e.g. individual, block or district heating plant)

Position № 17
Bypass road (-2)

Emission of pollutants from transit transport

Consider alternative routing – reduce the transit traffic in the territory of the city through the planned construction of city circuit segment through the natural monument protected by state “Defiliul Orhei”;
Construction of new city roads to link the city districts

Environmental factors

Water

Territory № 5

Zone of individual households with complimentary functions

(0,-1)

Risk of ground waters pollution from households

According to the law there is prohibited keeping of agricultural animals in the city area. Unfortunately in the private households this mainly takes place. The wastes and waste waters from animals have to be collected in special tanks and transmitted for treatment.



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SEA Orhei master Plan: Evaluation of Alternatives

1. Zero' or 'no-development; option
2. Alternative proposals for the bypass road in the framework of 2015 Master Plan
3. Comparison of the Master Plan Orhei 2015 and Master Plan of 2008

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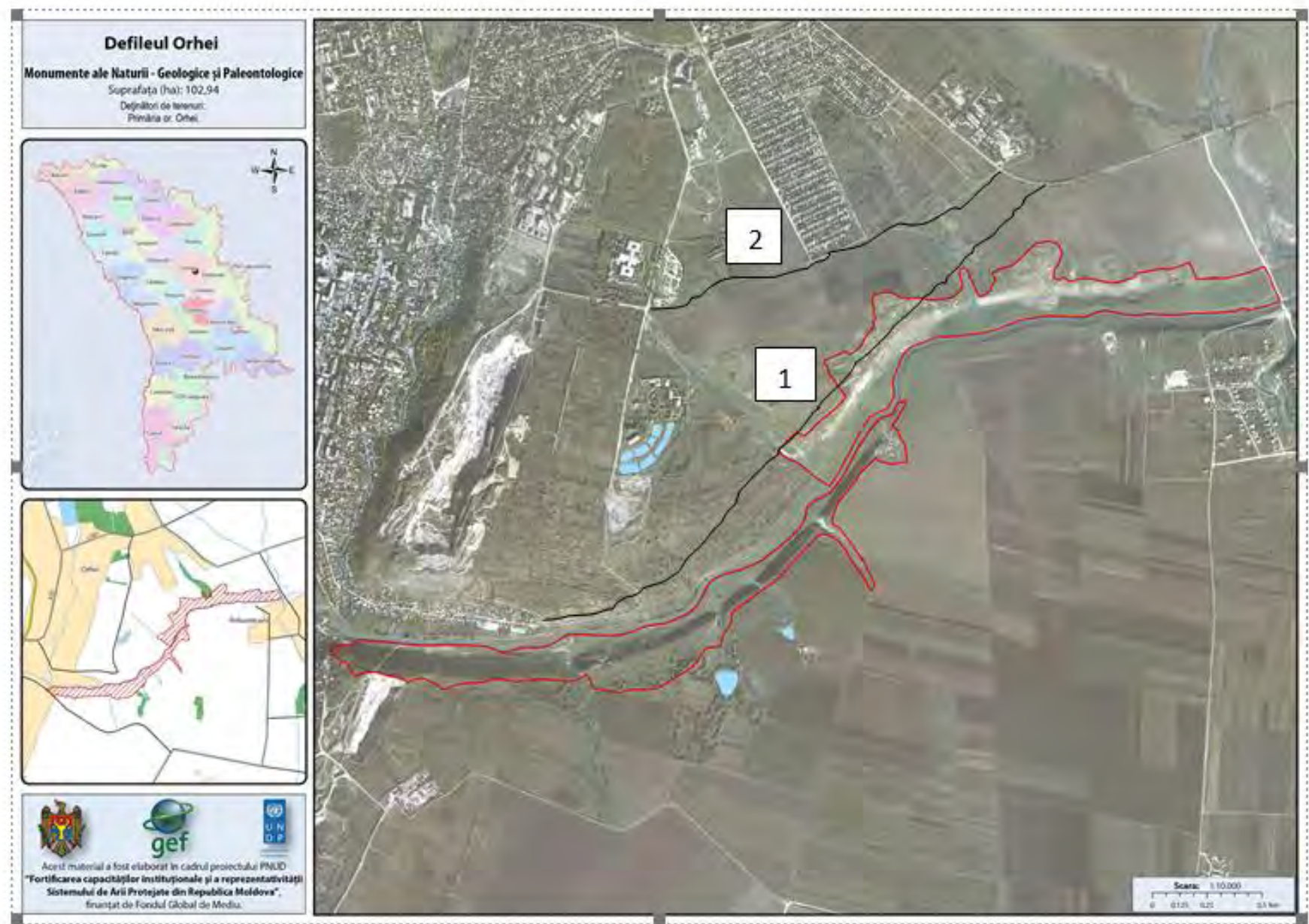
No. of the zone	Functional designation of land of the previous Master Plan 2008	Functional designation of land of the current Master Plan 2015	Impact on the environmental components				Comments (arguments for level of impact identified)
			Air	Water	Soil	Biodiversity	
1	2	3	4	5	6	7	8
1	Industrial production zone	Complex recreation zone with sport and touristic elements and water bodies	+2	+1	+1	+2	+1,+2 Elimination of the impact of the pollution from the industrial units on the atmospheric air, reduction of floods, reduction of pollution of water bodies. Due to the collection of funds from the recreation sites improvement of landscape and of recreational functions of the area
2	Zone of living areas with block apartments buildings	Complex recreation zone with sport and touristic elements and water bodies	+1	+1	+1	+1	+1 Elimination of the impact of the pollution from the industrial units on the atmospheric air, reduction of floods, reduction of pollution of water bodies. Due to the collection of funds from the recreation sites improvement of landscape and of recreational functions of the area



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SEA:

- Local road proposal modification
- Avoidance of conflict with the protected natural monument (missing from the planners dataset)



1 – Old proposed road (Master Plan 2008)

2 – New proposed road (accepted by the Master plan development team after the scoping process)



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SEA Orhei master Plan: Recommendations

- Development a system of drainage, which will reduce water pollution, improve environmental and sanitary conditions of the city;
- Closure and reclamation of existing landfills and old treatment plant to achieve positive effect on all components of the environment, including human health, improvement the overall environmental and aesthetic condition of the city;
- Closure of stone quarries in the city center - including employment of legal and administrative measures taken by the local authorities, as well as enforcing the land reclamation, which should be carried out by the owner of concerned quarries. This action will significantly reduce emissions of pollutants into the air, and reduce the noise;
- Creation of a single scheme of green areas including the expansion of green areas, forestation of water protection belts of rivers Raut, Ivanos, Vatici, and city lake area, development of recreation areas. Significant proportion of the green zone to be dedicated for pedestrian and bicycle paths, and playgrounds. This action will help to improve the quality of the components of the environment, including health, improve the urban landscape of the city.

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Major problems in conducting the SEA:

- Lack or limited availability of disaggregated data at the city level for the major sectors of concern (environmental protection, health, transport, social, industry) due to the national/rayon level set up of collection of statistical data and rayon-structured environmental and health authorities.
- The resources of the project did not allow to carry out field works or made calculations of the transport intensity on the major highways and central streets to compensate for the lack of consistent official monitoring;
- Access to the data and maps developed by the Master Plan team was ensured thanks to active communication and good will of all key stakeholders. Even though some of the essential components of the planning reached the SEA team with delays or being incomplete, especially after the forming of the new government in February 2015, when the political changes were also reflected by the new instructions for the Master Plan development (e.g. introduction of new territories for the industrial development). Provisions for the ready access of the SEA team to the most up-to-date planning outputs shall be a top priority when designing future SEA processes. ;

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Major problems in conducting the SEA:

- Some of the highlighted problems, like the old waste water treatment plant, old unauthorized landfill of the city and placement of the future regional landfill, national highway crossing the city (pollution and noise), mining and authorisation for mining activities, high-voltage electricity lines location– are not under the management and decision making authority of the city council and solutions needs to be sought at the regional or national level. In such cases, the SEA have not effective means to facilitate desired solution beyond publicly acknowledging the pressing issues and proposing actions for responsible authorities/decision makers (who are not necessarily directly engaged in the SEA process).
- The local budget did not have special lines for environmental protection or investments in environmental infrastructure, main funds being provided from the national level, or from external grants or loans.

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Added value of the Orhei SEA process :

- support to the Master Plan development team in the identification of the major environmental problems and in obtaining new data, necessary for the environmental chapter and environment related maps of the Master Plan (e.g. new maps and borders of the natural monument, river basin protection zones, data on enterprises).
- SEA facilitated the dialogue between local authorities and municipal services in the city, environmental and health authorities have participated on the Master Plan development and environmental problems evaluation through the SEA-initiated consultations;
- The local priority environmental problems were highlighted and will be presented at the national level, where solutions could be found, actions planned or funds made available or mobilized from internal or external sources
- Local authorities identified some gaps in their work, in the field of environment and urban planning, which partially were already reflected and addressed within the Master Plan and SEA process. Other will be likely solved through the development of the Local Environmental Action Plan or integration of the main issues (landfill, highway) in the sectorial development plans at the national/regional level;

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- Data gaps identified during the evaluation helped to formulate the needs to change/upgrade the data collection schemes for rayon and national statistical reporting, as well as the internal/departmental and administrative needs for specific data which have not been subject of regular statistics. The absence of data on level of noise and impact of the stone mines operations on the surrounding urban areas can be an example;
- Measures and indicators for the monitoring of the performance of the new Master Plan from environmental point of view were developed in the framework of the SEA.
- Cooperation between central environmental authorities and local public authorities was enlarged;
- The SEA facilitated identification of potential for improvement in the existing draft Law on SEA in Moldova, namely in aspects concerning scoping phase of SEA process, public consultations and awareness campaign, data sources availability, etc.

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SEA for the 1/100.000 Scale Territorial Development Plan Change Proposal for İzmir Çeşme Development Area (Turkey, 2021-ongoing)

- Planning Authority: Ministry of Culture and Tourism / Turkey Tourism Promotion and Development Agency
- SEA Competent Authority: Ministry of Environment and Urbanization
- Plan Contractor: Heavenly Made Mimarlık Tasarım Ltd. Şti.
- SEA Contractor: Eptisa Ltd. Şti.

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Çeşme Culture and Tourism Protection and Development Area

CTPDAs are defined as “the regions having a high potential for tourism development, intensive historical and cultural importance, that are to be evaluated for the purpose of preservation, utilisation, sectoral development and planned improvement...”

Çeşme CTPDA established 2019

Area 16,140 ha, of which 11,247
ha is land area.





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In 1/100.000 Scale Territorial Development Plan Change Proposal for **Çeşme** CTPDA, there are:

- Tourism Region (Tourism Area, Camping, Hotel, Boutique Hotel, Entertainment Centre, Rural Tourism Facility Area, Health Tourism Facility Area, Sports Tourism Facility Area), Daily Tourism, Eco-tourism, Golf Tourism),
- Urban and regional green and sports area (areas to be afforested, sports areas, recreation areas, recreational areas, etc.)
- Energy Production Area (Wind Power Plants, Transformer Area)
- **It is envisaged that İzmir Çeşme** CTPDA will serve a maximum of 100,000 people per day, of which approximately 30,000 people are resident population, 50,000 people are staying visitors and 20,000 are daily visitors.

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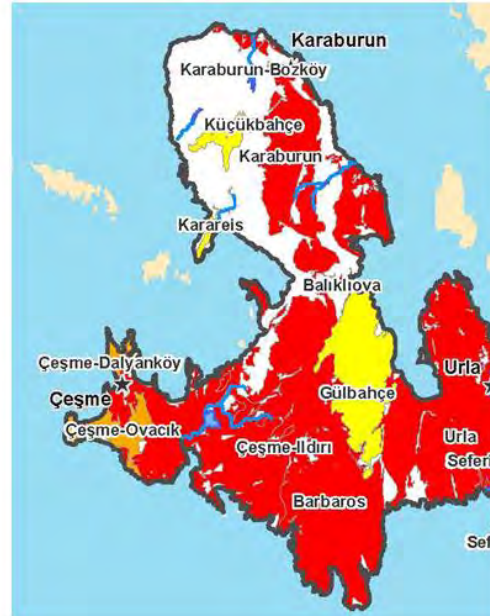
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1/100.000 Scale Territorial Development Plan Change Proposal for İzmir Çeşme CTPDA

AMOUNT AND QUALITY OF WATER RESOURCES



YASK Miktar Baskı Durumu



YASK Kalite Baskı Durumu



Ground Water Body

According to the Küçük Menderes River Basin Management Plan:

- In **Çeşme-İldırı Ground Water Body**, the pressure on quantity is low and the pressure on quality is high.
- In different studies: (Baba, 2020)
- Groundwater resources in the region are used for both drinking and irrigation water purposes,
- There are many wells drilled without a license, and
- It begins to become salty as a result of overdrawing,
- It is stated that the water levels decrease over time.

Source: Küçük Menderes Basin Management Plan, MoAF, 2019
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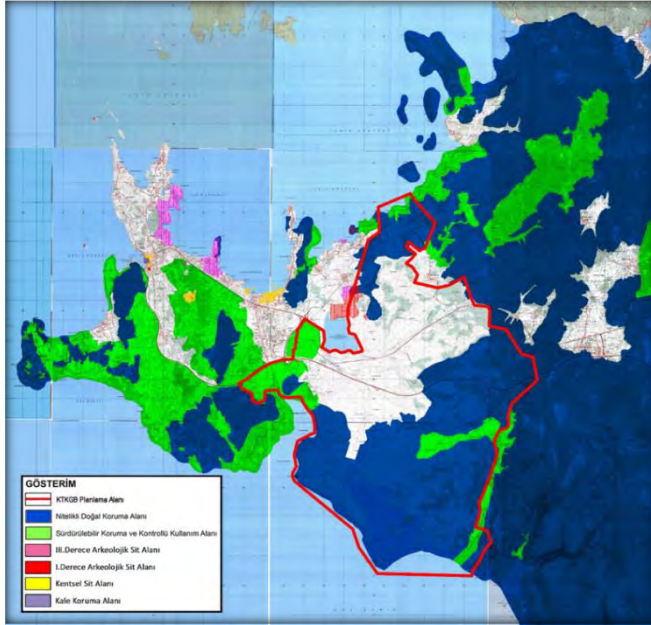
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1/100.000 Scale Territorial Development Plan Change Proposal for İzmir Çeşme CTPDA

ECOLOGY AND BIODIVERSITY

Natural Protected Area



A major part (approximately 60%) of **Çeşme CTPDA Planning Area** is within the borders of "Qualitative Natural Protection Area" and "Sustainable Conservation and Controlled Use Area" as Natural Protection Areas.

There is an ongoing Scientific Research Study based on Ecology for the **Çeşme CTPDA** area. According to the results of this study:

- 23 taxa are globally endangered, including 2 EN plants, 5 VU birds, 1 CR fish, 2 EN fish, 4 VU fish, 1 VU reptile, 1 EN mammal, 5 VU mammals, 2 VU invertebrates.
- 145 taxa and nationally endangered, including 2 VU plants, 16 CR birds, 47 EN birds, 65 VU birds, 1 CR fish, 2 EN fish, 4 VU fish, 1 VU invertebrate, 2 CR mammals, 5 VU mammals.
- 163 taxa have a critical distribution on a global scale, including 3 plants as narrow, 22 plants as regional, 5 plants as wide, 4 birds as narrow, 2 birds as regional, 121 birds as wide, 1 mammal as narrow, 5 mammals as regional.
- 182 taxa have a critical distribution at the national scale, including 12 plants as narrow, 12 plants as regional, 23 plants as wide, 1 bird as narrow, 7 birds as regional, 120 birds as wide, 1 mammal as narrow, 5 mammals as regional, 1 mammal as wide
- There 9 endemic plant species (the probability of 2 species detected in the literature is negligible).

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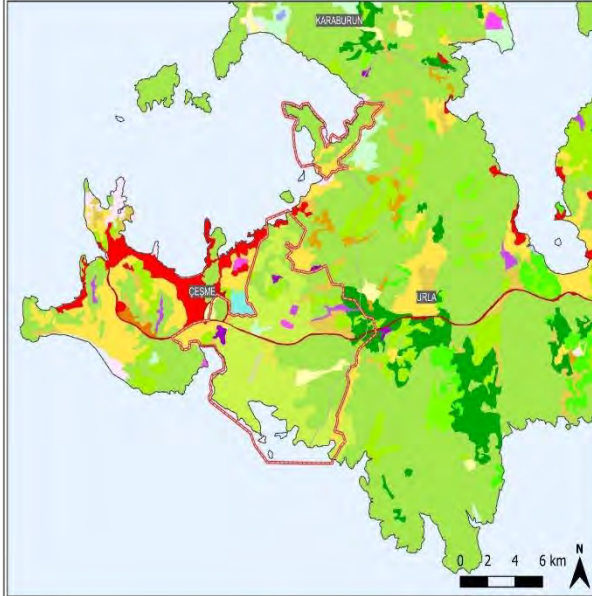
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1/100.000 Scale Territorial Development Plan Change Proposal for İzmir Çeşme CTPDA

LAND USE



Lejant

2018 Arazi Kullanımı

- Sürekli kentsel doku
- Sürekli olmayan kentsel doku
- Endüstriyel veya ticari birimler
- Karayolu ve demiryolu ağları ve ilgili arazi
- Limanlar
- Havaalanları
- Maden çıkarım sahaları
- Döküm sahaları
- İnşaat alanları
- Yeşil kentsel alanlar
- Spor ve eğlence alanları
- Sulanmayan ekilebilir arazi
- Kalıcı olarak sulanan arazi

- Üzüm bağları
- Meyve ağaçları
- Zeytinlikler
- Meralar
- Karıyık yetiştirme alanları
- Önemli doğal bitki örtüsüne sahip, esas olarak tarımla kullanılan arazi
- Tarımsal orman alanları
- Geniş yapraklı orman
- İğne yapraklı orman
- Karıyık orman arazisi
- Doğal çayır/otlaklar
- Sclerophyll bitki örtüsü
- Bitki değişim alanları
- Sahiller, kumsallar, kumluklar

- Seyrek bitki örtüsü
- İç bataklıklar
- Tuz bataklıkları
- Tuzlalar
- Su yolları
- Su kütelleri
- Kıyı lagünleri
- Haliçler
- Deniz ve okyanus
- Yanmış alanlar

İdari sınırlar

- İl sınırı
- İlçe sınırı
- Proje alanı

Current Land Use of the Planning Area

Natural shrubs cover the largest area with 5,926.4 ha and constitute 37% of the total area.

Then, Sclerophyll Vegetation covering 4,547.8 ha constitutes 28% of the entire area.

In the third rank, the sea area covering 2,292.4 ha constitutes 14% of the entire area.

Urban settlement constitutes 0.27% of the entire area with an area of 43.7 ha.

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SEA Cesme Scoping

- Water Amount
- Water Quality
- Climate and Energy
- Livelihood
- Biodiversity
- Soil
- Human Health
- Cultural Heritage
- Waste
- Sociocultural Impacts
- Air Quality
- Noise
- Landscape
- Odour





SEA Scoping matrix (part)

Key Issue	Specific Issues	Aspects that could be included in the plan and the SEA	Related goals and objectives at national and/or regional level
Water Quality	<p>Due to the tourism facilities and residences within the scope of the plan, a waste water will be generated that must be managed.</p>	<p>Within the scope of the plan, planning waste water management (including details of reducing the amount of waste water to be generated, treatment plant(s), discharge point(s) etc.). Evaluation of the existence of a wastewater management plan and environmental impacts of alternatives within the scope of SEA.</p>	<p>11th Development Plan Turkey's Tourism Strategy 2023 Wastewater Treatment Action Plan, MoEU, 2017-2023: It is stated that in order to solve the problem due to the large differences between the summer and winter populations in the settlements with tourism and holiday features, investments that allow the wastewater of large hotels to be treated by themselves should be made compulsory or encouraged. Küçük Menderes Basin, River Basin Management Plan, MoAF, 2019: In order to protect the Alaçatı (Kutlu Aktaş) Drinking Water Dam, it has been suggested in the measures program to build a green belt in a 10 m buffer area around the dam, with the coordination of İZSU and MEU-Water Management General Directorate. Regulation on the Protection of Drinking and Utility Water Basins(O.G. 30224 dated 28.10.2017) Regulation on Protection of Groundwater Against Pollution and Deterioration (O.G. 28257 dated 07.04.2012), MoAF Regulation on Surface Water Quality O.G. 28483 dated 30.11.2012), MoAF</p>
	<p>Increased traffic due to tourism facilities and residences within the scope of the plan may pose a pollution risk for wastewater, surface and underground water resources (Alaçatı Dam, streams). Maintenance operations of golf courses may pose a risk of surface and underground water pollution. If there is an increase in groundwater withdrawal, there may be an increased risk on groundwater quality/amount.</p>	<p>Within the scope of the plan, considering the effects of pollution risk on underground and surface water resources when planning transportation plan, water supply plan, wastewater management plan, golf course operation systems. Consideration of measures such as selection of grass types, organic fertilizer and spraying systems to be used by golf courses with ecological sensitivity during the SEA and planning stages. Evaluation of the impact of the Plan and other sub-plans that are part of the plan (transport plan, water supply plan, waste management plan) on the quality of existing surface and ground water resources within the scope of the SEA.</p>	



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SEA Scoping matrix (part II)

Key Issue	Specific Issues	Aspects that could be included in the plan and the SEA	Related goals and objectives at national and/or regional level
Biodiversity	<p>54.62% of Çeşme CTPDA falls within the "Qualified Natural Protection Area" and 7.47% "Sustainable Conservation and Controlled Use Area". There are many critical species (plant, fish, reptile, mammal, invertebrate, bird) in the region. These species may be in danger of extinction due to both the construction of the facilities within the scope of the plan and the human pressure during the operation phase.</p> <p>İzmir Çeşme CTPDA coasts are among the important Mediterranean monk seal areas of Turkey. The entire planning area is designated as an important bird area (IBA). Human pressure due to the facilities to be built within the scope of the planning may affect these sensitive species.</p> <p>In case of planning a desalination plant in water supply, the concentrate (waste water) to be formed in the plant may have an effect on aquatic organisms depending on the disposal management (in case of discharge into the sea).</p>	<p>Within the scope of the plan, Ecological Research and Evaluation Study is currently underway.</p> <p>Investigation of the effects on species (by preparing overlap maps for the location of tourism facilities and the locations of sensitive species) due to human pressure both during the construction of the facilities proposed to be built within the scope of the plan and during the operation phase of the plan, during the WFD phase.</p> <p>In the water supply plan, if there is a desalination plant, possible sensitive species should be taken into consideration at the discharge point.</p>	<p>11th Development Plan, 2019-2023</p> <p>National Biodiversity Strategy and Action Plan, former Ministry of Environment and Forestry, 2007</p> <p>Küçük Menderes Basin River Basin Management Plan, MoAF, 2019</p> <p>İzmir Metropolitan Municipality, 2020-2024 Strategic Plan</p> <p>Regulation on the Protection of Wetlands (O.G. 28962 dated 04.04.2014, amendment 2019)</p>



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Results of Scoping

Potential limiting factors:

- Water availability
- => Dedicated study commissioned (among alternatives considering desalination of sea water)
- Biodiversity protection
- => Dedicated study to verify actual condition of protected biodiversity (potential for reclassification of the protected areas)

Scoping Consultations: Indication of public opposition to the plan

Next stage: Plan draft evaluation

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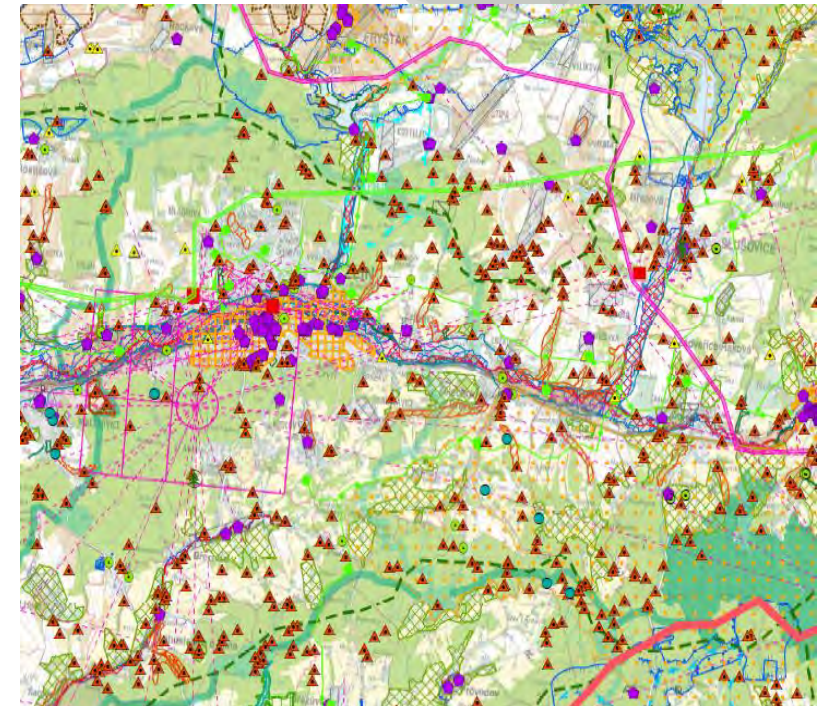
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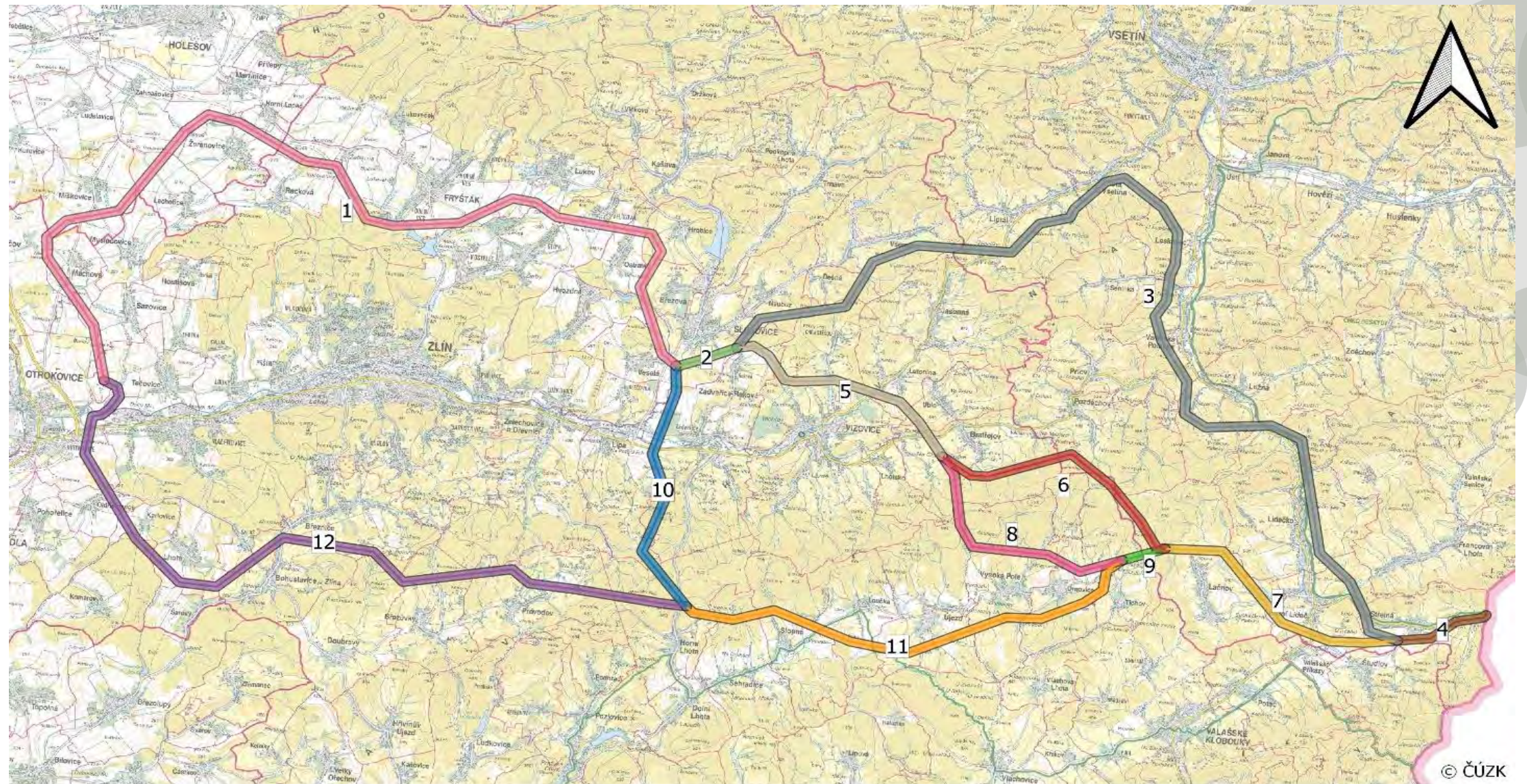
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SEA for Territorial plan of Zlínský region: study of alternatives for the 400kV power line

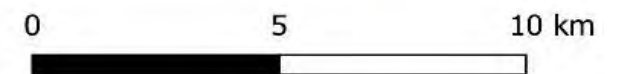
Comparison of environmental impacts of pre-selected alternative connections between Otrokovice and state border with Slovakia





Příslušnost jednotlivých úseků k variantám záměru:

- VARIANTA A: úseky 1, 2, 3 a 4
- VARIANTA B: úseky 1, 2, 4, 5, 6 a 7
- VARIANTA C: úseky 1, 2, 4, 5, 7, 8, 9
- VARIANTA D: úseky 1, 4, 7, 9, 10, 11
- VARIANTA E: úseky 4, 7, 9, 11, 12



Potential environmental impacts	Indicators	Evaluation metrics
Air and Climate	Air quality	General description
	Climate and climate risks	General description
Noise and other physical characteristics	Noise and vibration	Conflict with built-up areas
	Non-ionizing radiation	Conflict with built-up areas
Surface and underground waters	Area protected for water accumulation	plocha střetu
	Surface waters running	Area of conflict
	Surface waters lakes	Area of conflict
	Wetlands of international importance	Area of conflict
	Flood areas including active zones	Area of conflict
	Underground waters	General description
Soil	Forests	plocha střetu
	Agriculture land of 1 st and 2 nd protection category	Area of conflict
Natural resources	Protected mineral deposits areas	Area of conflict
	Mining areas	Area of conflict
	Mineral deposits	Area of conflict
	Old mining areas	Area of conflict
	Water resources and protection zones	Area of conflict
	Přírodní léčivé zdroje a jejich ochranná pásma	Number of conflicts cases + area of conflict
	Chráněné oblasti přirozené akumulace vod	Area of conflict



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Cultural monuments	-1	-1	-1	-1	0	2	-2	-2	-2	-2	0
Area with frequent archeological finds	-1	-1	-1	-1	-1	1	-1	-1	-1	-1	-1
Objects and complexes with historical value	0	0	0	-1	-1	1	0	0	0	-1	-1
Architecturally valuable objects	-1	-1	-1	0	0	1	-1	-1	-1	0	0
Landslide risks area	-2	-1	-1	-2	-2	2	-4	-2	-2	-4	-4
Old ecological burden	-1	-1	-1	-1	0	1	-1	-1	-1	-1	0
SUM OF EVALUATIONS	-37	-27	-25	-33	-24		-67	-47	-43	-60	-41
RANKING OF VARIANTS	5.	3.	2.	4.	1.		5.	3.	2.	4.	1.

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SEA input in the planning decision

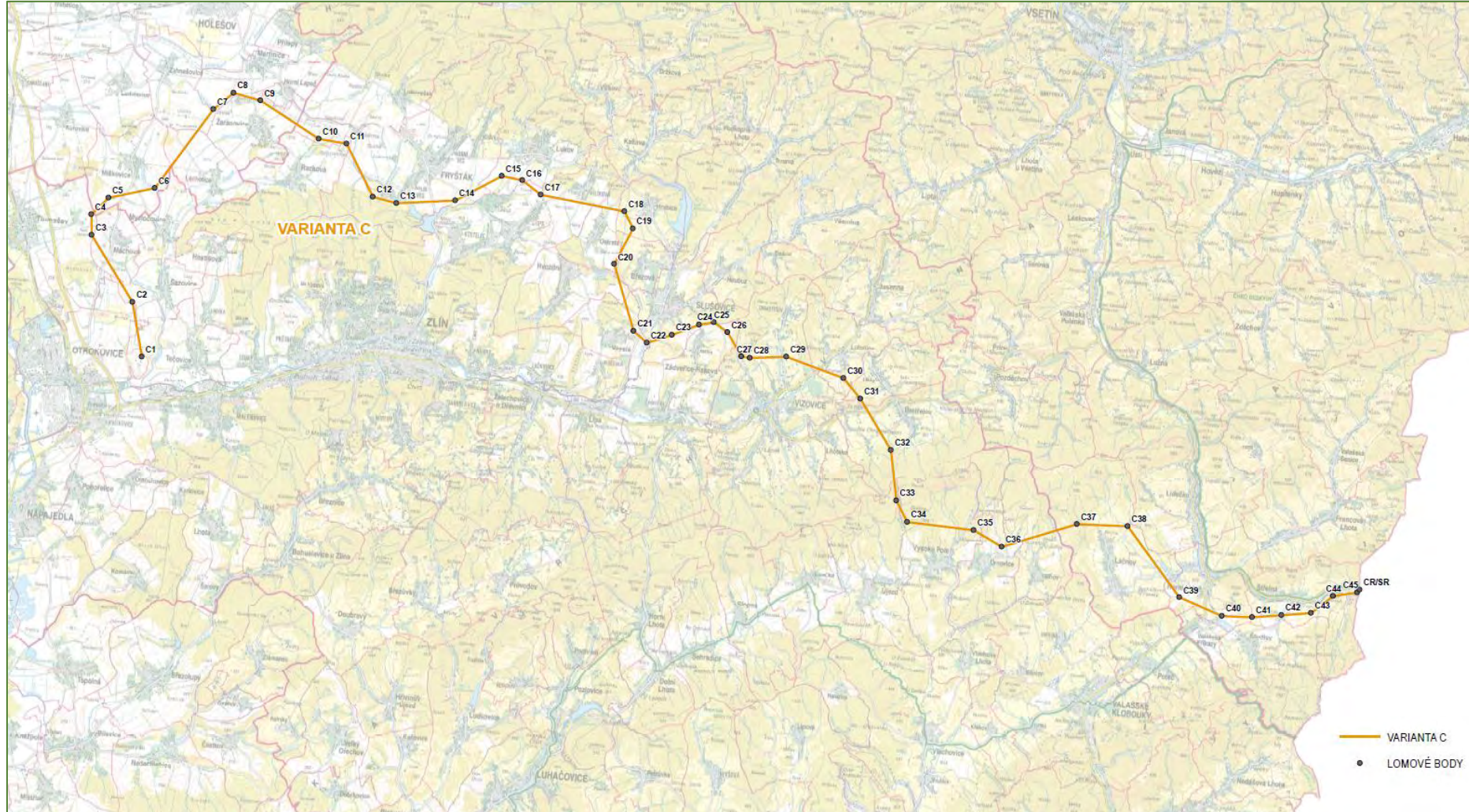
	Order (1 – best, 5 – worst)				
	1.	2.	3.	4.	5.
SEA evaluation	Varianta E	Varianta C	Varianta B	Varianta D	Varianta A
Assessment of impact on NATURA 2000 sites	Varianta B Varianta C Varianta D Varianta E	-	-	-	Varianta A
Landscape impact	Varianta C	Varianta D	Varianta B	Varianta A	Varianta E
Technical-economic assessment	Varianta C	Varianta B	Varianta D	Varianta A	Varianta E
SWOT (scope of weaknesses and threats)	Varianta C	Varianta B Action implemented by:	Varianta D Varianta E	-	Varianta A



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Recommended alternative: Alternative C





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Questions?

Thank you for your attention!

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