

# **Environmental and Social Impact Assessment**

## ***Preliminary***

### **Ungheni-Chisinau Natural Gas Pipeline**



Guvernul Republicii Moldova  
**Ministerul Economiei**




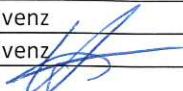
The study is financed through technical assistance from the  
Government of Sweden and SIDA.

**FICHTNER**

# FICHTNER

Sarweystrasse 3  
70191 Stuttgart • Germany  
Phone: +49 711 8995-0  
Fax: +49 711 8995-459  
[www.fichtner.de](http://www.fichtner.de)

**Please contact:** Sofia Sousa  
**Extension:** 726  
**E-mail:** [sofia.sousa@fichtner.de](mailto:sofia.sousa@fichtner.de)

Rev No.	Rev-date	Contents /amendments	Prepared/revised	Checked/released
0	17.07.2015	Draft Preliminary ESIA Report	Sousa/Heinold	Fricke/ Heidt-Ivenz
1	26.12.2015	Draft Final Preliminary ESIA Report	Sousa/Heinold/Kaul/ Hoffner/Miller	Heidt-Ivenz
2	12.02.2016	Draft Final Preliminary ESIA Report	Sousa/Kaul/Heinold	Heidt-Ivenz
3	04.03.2016	Draft Final Preliminary ESIA Report	Sousa 	Heidt-Ivenz 



# Table of Contents

<b>Table of Contents</b>	<b>I</b>
<b>List of Figures</b>	<b>VI</b>
<b>List of Tables</b>	<b>VIII</b>
<b>Abbreviations and Acronyms</b>	<b>XIV</b>
<b>1. Executive Summary</b>	<b>1-1</b>
1.1 Introduction	1-1
1.2 Project description	1-2
1.3 Legal, institutional and policy framework	1-3
1.4 ESIA Methodology	1-9
1.5 Consideration of alternatives	1-9
1.6 Environmental and Social Baseline	1-10
1.7 Assessment and mitigation of impacts	1-14
1.8 Selection of the routing option	1-20
1.9 Environmental and Social Management Plan	1-22
1.10 Public and Stakeholder Consultation	1-23
1.11 Resettlement Policy Framework	1-24
1.12 Environmental and Social Action Plan	1-26
1.13 Conclusion	1-29
<b>2. Introduction</b>	<b>2-1</b>
2.1 Need for an ESIA - Screening	2-2
2.2 The ESIA scoping	2-3
<b>3. Project Description</b>	<b>3-1</b>
3.1 Pipeline	3-1
3.2 Above Ground Installations	3-2
3.2.1 Block Valve Stations	3-2
3.2.2 Gas Pressure Regulation Stations (GPRS)	3-2
3.2.3 Pigging Facilities	3-3
3.3 Detailed design	3-3
3.4 Pre-construction	3-3
3.5 Construction	3-4
3.5.1 Crossing of rivers, lakes and wetlands	3-5

3.6	Commissioning	3-6
3.7	Operation and Maintenance	3-6
3.8	Project's location	3-7
<b>4.</b>	<b>Legal, institutional and policy framework</b>	<b>4-1</b>
4.1	National Legal Framework	4-1
4.1.1	Law on Environmental Impact Assessment	4-1
4.1.2	Water Law	4-2
4.1.3	Law on environmental protection	4-3
4.1.4	Law on the fund of natural territories protected by the State	4-3
4.1.5	Government decision on the creation of the State Natural Reserve „Plaiul Fagului“	4-5
4.1.6	Red Data Book of Moldova	4-6
4.1.7	National legal framework for land acquisition and compensation	4-7
4.2	National Institutional Framework	4-12
4.2.1	Ministry of Economy (MoE)	4-13
4.2.2	MEPIU	4-13
4.2.3	Ministry of Environment (MoEn)	4-13
4.3	International Legal, Institutional and Policy Framework	4-15
4.3.1	EU EIA Directive	4-15
4.3.2	EU Habitats Directive	4-16
4.3.3	EU Birds Directive	4-17
4.3.4	International conventions	4-17
4.3.5	EU Neighborhood Investment Facility (EU NIF)	4-19
4.3.6	European Bank for Reconstruction and Development (EBRD)	4-19
4.3.7	European Investment Bank (EIB)	4-22
4.4	International environmental standards	4-24
4.5	Gap Analysis	4-26
<b>5.</b>	<b>ESIA Methodology</b>	<b>5-1</b>
5.1	Methodology for data collection	5-1
5.2	Methodology for classifying the impacts	5-2
5.3	Challenges and uncertainties	5-3
<b>6.</b>	<b>Consideration of Alternatives</b>	<b>6-1</b>
6.1	Description of the initial options	6-2
6.1.1	Options 1 and 1b	6-2

6.1.2	Option 2	6-2
6.1.3	Option 3	6-2
6.1.4	Common section	6-3
6.2	Selection of the most suitable options	6-3
6.2.1	Results	6-4
6.3	Refinement of options	6-2
6.4	Further refinement of Option 1	6-7
<b>7.</b>	<b>Environmental and Social Baseline</b>	<b>7-1</b>
7.1	Physical environment	7-2
7.1.1	Monitoring of the physical environment in Moldova	7-3
7.1.2	Topography	7-4
7.1.3	Geology	7-5
7.1.4	Soils	7-5
7.1.5	Climate	7-7
7.1.6	Air Quality	7-9
7.1.7	Noise	7-10
7.1.8	Hydrology	7-10
7.1.9	Hydrogeology	7-18
7.1.10	Landscape	7-19
7.2	Biological environment	7-21
7.2.1	Protected areas	7-21
7.2.2	The National Ecological Network of the Republic of Moldova	7-30
7.2.3	Other flora and fauna	7-33
7.2.4	State of and threats to biodiversity in Moldova	7-36
7.3	Human Environment	7-37
7.3.1	Administrative organization	7-38
7.3.2	General economic conditions	7-39
7.3.3	District profiles	7-41
7.3.4	Ethnic composition	7-44
7.3.5	Level of education	7-44
7.3.6	Agriculture	7-44
7.3.7	Income and expenditure	7-45
7.3.8	Water and sanitation	7-47
7.3.9	Access to electricity	7-47
7.3.10	Tourism	7-48

7.3.11	Significant cultural, religious and historical sites	7-48
<b>8.</b>	<b>Assessment and mitigation of impacts</b>	<b>8-1</b>
8.1	Impacts and measures during the construction phase	8-3
8.1.1	Impacts on the Physical Environment	8-6
8.1.2	Impacts on the Natural Environment	8-30
8.1.3	Impacts on the Human Environment	8-19
8.2	Impacts and measures during the operational phase	8-34
8.2.1	Impacts on the Physical Environment	8-34
8.2.2	Impacts on the Natural Environment	8-37
8.2.3	Impacts on the Human Environment	8-38
<b>9.</b>	<b>Selection of the routing option</b>	<b>9-1</b>
<b>10.</b>	<b>Environmental and Social Management Plan</b>	<b>10-1</b>
10.1	Roles and responsibilities	10-1
10.1.1	MoE/MEPIU	10-2
10.1.2	Consulting Engineers	10-3
10.1.3	Construction Contractor	10-4
10.1.4	Operation Contractor	10-4
10.1.5	Governmental authorities	10-5
10.2	Adaptive management	10-6
10.3	Compilation of the Environmental and Social Management Plan	10-6
10.4	Construction workers camps	10-42
10.4.1	IFIs' requirements	10-42
10.4.2	Other requirements	10-43
<b>11.</b>	<b>Public and Stakeholder Engagement</b>	<b>11-1</b>
11.1	Main responsibilities	11-1
11.2	Planned and undertaken engagement activities	11-1
11.3	Public's opinion on the project	11-3
11.4	Public Participation Report	11-4
<b>12.</b>	<b>Resettlement Policy Framework</b>	<b>12-1</b>
12.1	Resettlement impacts of the project	12-2
12.2	Legal framework for resettlement	12-4
12.2.1	Gap analysis	12-5
12.3	Guiding principles for resettlement	12-12

12.4 Compensation	12-13
12.4.1 Compensation for ephemeral agricultural crops temporarily lost	12-14
12.4.2 Compensation for vineyards and orchards permanently lost	12-15
12.4.3 Land purchase (expropriation) for above ground facilities	12-15
12.4.4 Total economical resettlement costs	12-16
12.5 Entitlements Matrix	12-16
12.6 Resettlement planning	12-17
12.7 Monitoring	12-18
12.7.1 LRF Consultant	12-19
12.8 Grievance mechanism	12-19
12.9 Responsibilities for LRF	12-21
<b>13. Environmental and Social Action Plan</b>	<b>13-1</b>
<b>14. Conclusion</b>	<b>14-1</b>
<b>15. References</b>	<b>15-1</b>
<b>16. Annexes</b>	<b>16-1</b>
16.1 Protected species in the project area	16-1
16.1.1 Natural forest reserve Seliște-Leu	16-1
16.1.2 Scientific Reserve Plaiul Fagului	16-5
16.1.3 Landscape Reserve Cazimir-Milesti	16-25
16.1.4 Scientific Reserve Codrii	16-30
16.2 Questionnaires used in the socio-economic survey	16-49
16.3 Socio-economic data for the project area	16-50
16.4 Significant cultural, religious and historical sites in/nearby the project area	16-67
16.5 Authorized agents for management of recyclable waste	16-79
16.6 Public Consultation and Disclosure Plan	16-83
16.7 Maps	16-84



## List of Figures

Figure 3-1:	Sketch of the Pipeline System	3-1
Figure 3-2:	Construction of a Pipeline	3-5
Figure 3-3:	Districts within the project area	3-7
Figure 6-1:	Overview of the initially considered routing options	6-1
Figure 6-2:	Optimization of the route Option 1 between points 145 and 149 to avoid proximity with industrial buildings, the Bîc river and the damaged water treatment plant (the non-connected red dots correspond to the previous line routing)	6-4
Figure 6-3:	Optimization of the route Option 1 between points 186 and 188 to avoid proximity to a lake (the non-connected red dot corresponds to the previous line routing)	6-5
Figure 6-4:	Optimization of the route Option 1b between points 15 and 20 to avoid crossing an erosion prone area (the non-connected red dots correspond to the previous line routing)	6-5
Figure 6-5:	Optimization of the route Option 2 between points 182 and 192 to avoid proximity to the village of Sendreni in the Nisporeni rayon (the non-connected yellow dots correspond to the previous line routing)	6-6
Figure 6-6:	Optimization of the common section between points 46 and 48 to avoid passing through a ravine (the non-connected purple dot corresponds to the previous line routing)	6-6
Figure 6-7:	Overview of the refined routing options	6-7
Figure 6-8:	Overview of the finally considered routing options	6-8
Figure 7-1:	Location of the project area within Moldova	7-2
Figure 7-2:	Districts crossed by the project	7-2
Figure 7-3:	Location of the project area within the bio-geographical Continental Zones (URL 3)	7-3
Figure 7-4:	Environmental monitoring network of Moldova and location of the project area (URL 4)	7-4
Figure 7-5:	Elevations map of the project area (URL 5)	7-5
Figure 7-6:	Soil types in the project area (URL 5)	7-6
Figure 7-7:	Soil resources of Moldova (ha) (MoEn and MoH, 2010)	7-6
Figure 7-8:	Pedo-climatic zones crossed by the project (URL 5)	7-8
Figure 7-9:	Air quality in Chisinau between 2007 and 2013 - fraction of the annual Maximum Allowable Concentration (MAC) reached by some pollutants (adapted from BNS, 2014)	7-9
Figure 7-10:	The river basins of Moldova and location of the project area	7-11
Figure 7-11:	Dniester River basin and location of the project area (MoEn, 2014)	7-12
Figure 7-12:	Crossing of a narrow stem of River Bîc between APs 362 and 363 of Option 1b	7-13
Figure 7-13:	Bîc River basin and location of the project area (MoEn, 2014)	7-14
Figure 7-14:	Prut River basin and location of the project area (MoEn, 2014)	7-15
Figure 7-15:	Crossing of a narrow stem of River Delia between APs 15 and 16 of Option 1b	7-15
Figure 7-16:	Lake/wetland crossed by Option 1b (red line) and Option 2 (yellow line) in Todiresti, Ungheni (satellite image)	7-16

Figure 7-17:	Lake/wetland crossed by Option 1b (red line) and Option 2 (yellow line) in Todiresti, Ungheni (pictures)	7-17
Figure 7-18:	Lake/wetland crossed by Option 2 (yellow line) in Varzaresti, Nipsoreni	7-18
Figure 7-19:	Pictures of the project area (site visit undertaken in October 2014)	7-20
Figure 7-20:	Protected Areas in the vicinities of the project Area	7-22
Figure 7-21:	IBAs in the vicinity of the project area	7-30
Figure 7-22:	Ecological corridor crossed by both options (in pink)	7-32
Figure 7-23:	Forestry vegetation of Moldova and location of the project area (Teleuță, A., 2010)	7-35
Figure 7-24:	Average agricultural parcel size in Moldova (Government of Moldova, 2011)	7-40
Figure 7-25:	Household income sources (%)	7-46
Figure 7-26:	Household expenditures (%)	7-46
Figure 7-27:	Access to water supply and sanitation services (%) (Pienaru, A., et al, 2014)	7-47
Figure 8-1:	Construction of a pipeline	8-4
Figure 8-2:	Rutting occurring in a wet soil after passage of vehicles (URL 11)	8-8
Figure 8-3:	A slope drain (Mathews, J., 2006)	8-11
Figure 8-4:	Protection buffer of the Scientific Reserve Plaiul Fagului (orange line)	8-33
Figure 8-5:	Wildlife escape ramp (NMDGF, 2007)	8-36
Figure 8-6:	Location of the future GPRS #3 in the vicinity of water reservoirs	8-35
Figure 16-1:	How people usually learn about some important news/facts (3.5 mil)	16-66
Figure 16-2:	Cultural heritage sites on the pipeline route (Ungheni – Chisinau)	16-75
Figure 16-3:	Cultural heritage sites on the potential affected localities (Ungheni district)	16-76
Figure 16-4:	Cultural heritage sites on the potential affected localities (Nisporeni district)	16-76
Figure 16-5:	Cultural heritage sites on the potential affected localities (Calarasi district)	16-77
Figure 16-6:	Cultural heritage sites on the potential affected localities (Straseni district)	16-77
Figure 16-7:	Cultural heritage sites on the potential affected localities (Mun. of Chisinau)	16-78

## List of Tables

Table 1-1:	Protected areas in the vicinity or within the project area	1-11
Table 1-2:	Qualitative comparison of options	1-21
Table 4-1:	IFC Hydrotesting water emission limits (IFC, 2007b)	4-24
Table 4-2:	IFC Ambient noise limits (IFC, 2007)	4-25
Table 4-3:	IFC and EU Occupational noise limits	4-25
Table 4-4:	IFC and EU Air Quality Standards	4-26
Table 4-5:	Gap analysis between the EIB and EBRD's requirements and the Moldovan legislation on EIA	4-28
Table 6-1:	Classification of the route options based on the extension and nature of the impacted features	6-5
Table 6-2:	Overall classification of the route options for all features and for the significant features	6-1
Table 6-3:	Description of the modifications made to the route	6-2
Table 6-4:	Overview of the main characteristics of the original and the optimized route options	6-6
Table 7-1:	Discharge rates of the river Bic (source: Ministry of Environment of Moldova)	7-13
Table 7-2:	Discharge rates of the river Delia (source: Ministry of Environment of Moldova)	7-16
Table 7-3:	Protected areas in the vicinity or within the project area	7-21
Table 7-4:	Protected species living in the reserve Plaiul Fagului (only Moldova Red Book and IUCN Red List)	7-24
Table 7-5:	Protected species living in the reserve Cazimir-Milesti (only Moldova Red Book and IUCN Red List)	7-28
Table 7-6:	Protected species living in the reserve Seliște-Leu (only Moldova Red Book and IUCN Red List)	7-29
Table 7-7:	Important Bird Areas in the vicinity of the project area	7-29
Table 7-8:	Administrative districts/municipality of the project area	7-39
Table 7-9:	Ethnic composition of the project area [%]	7-44
Table 7-10:	Level of education in the project area [%]	7-44
Table 7-11:	Major ephemeral crops in the districts crossed by the project [tonnes]	7-45
Table 8-1:	Area of land temporarily necessary for construction of the pipeline	8-5
Table 8-2:	Estimative of the volume of top soil to be stripped for the project	8-5
Table 8-3:	Estimative of the volume of sub soil to be excavated for the project	8-5
Table 8-4:	Impacts on the physical environment - erosion - affected area	8-7
Table 8-5:	Impacts on the physical environment - mixing, rutting and compaction - affected area	8-9
Table 8-6:	Classification of the impacts on the soil due to erosion - construction phase	8-12
Table 8-7:	Classification of the impacts on the soil due to mixing, rutting and compaction - construction phase	8-12
Table 8-8:	Classification of the impacts on the soil due to waste deposition - construction phase	8-15
Table 8-9:	Impacts on the physical environment - water - number of crossings and affected area and length	8-17

Table 8-10:	Discharge rate of rivers in the project area (source: Ministry of Environment of Moldova)	8-21
Table 8-11:	Classification of the impacts on the water resources - construction phase	8-22
Table 8-12:	Impacts on the physical environment during construction - air quality - affected area	8-23
Table 8-13:	Classification of the impacts on the air quality - construction phase	8-24
Table 8-14:	Impacts on the physical environment during construction - noise - affected area	8-25
Table 8-15:	Classification of the impacts on the noise levels - construction phase	8-26
Table 8-16:	Impacts on the physical environment during construction - landscape - affected area	8-28
Table 8-17:	Classification of the temporary impacts on the landscape - construction phase	8-29
Table 8-18:	Classification of the permanent impacts on landscape - construction phase	8-29
Table 8-19:	Impacts on the natural environment during construction - protected areas - impacted area, major biodiversity values and target species	8-31
Table 8-20:	Mitigation measures, including pre-construction surveys, for protected species listed in the IUCN Red List and the Moldova Red Data Book (for Option 1b and Option 2)	8-0
Table 8-21:	Classification of the impacts on protected areas - construction phase	8-12
Table 8-22:	Classification of the impacts on the ecological corridors - construction phase	8-13
Table 8-23:	Impacts on the natural environment during construction - aquatic fauna - number of crossings and affected area and length	8-14
Table 8-24:	Impacts on the natural environment during construction - terrestrial fauna - impact area	8-14
Table 8-25:	Classification of the impacts on fauna - construction phase	8-16
Table 8-26:	Impacts on the natural environment during construction - riparian flora - number of crossings	8-17
Table 8-27:	Impacts on the natural environment during construction - terrestrial flora - impact area	8-17
Table 8-28:	Classification of the impacts on flora - construction phase	8-18
Table 8-29:	Impacts on the human environment - land and property (crops) - affected area and compensation costs	8-20
Table 8-30:	Impacts on the human environment - land and property (temporary disturbances to pastures) - affected area	8-21
Table 8-31:	Impacts on the human environment - land and property (land acquisition) - affected area	8-22
Table 8-32:	Classification of the impacts on land and property - construction phase	8-24
Table 8-33:	Classification of the impacts on access - construction phase	8-25
Table 8-34:	Classification of the impacts on utilities - construction phase	8-26
Table 8-35:	Classification of the impacts on occupational health and safety - construction phase	8-28

Table 8-36:	Classification of the impacts on community health and safety - construction phase	8-30
Table 8-37:	Classification of the impacts on economy and employment - construction phase	8-31
Table 8-38:	Classification of the impacts on cultural heritage - construction phase	8-32
Table 8-39:	Classification of the impacts on water and soil - operation phase	8-35
Table 8-40:	Classification of the impacts on the air quality - operation phase	8-36
Table 8-41:	Impacts on the natural environment during operation - trees - impact area	8-37
Table 8-42:	Classification of the impacts on the natural environment - operation phase	8-37
Table 8-43:	Classification of the impacts on agricultural assets - operation phase	8-38
Table 8-44:	Classification of the impacts on occupational health & safety - operation phase	8-39
Table 8-45:	Classification of the impacts on community health & safety - operation phase	8-41
Table 9-1:	Summary of the classification and comparison of the impacts of Options 1b and 2	9-2
Table 10-1:	Environmental and Social Management Plan for the Ungheni-Chisinau pipeline project - Mitigation and/or compensation measures	10-7
Table 10-2:	Environmental and Social Management Plan for the Ungheni-Chisinau pipeline project - Monitoring measures	10-37
Table 11-1:	Information disclosure activities planned/undertaken for the project	11-2
Table 11-2:	Public Consultation activities planned/undertaken for the project	11-3
Table 12-1:	Impacted areas due to the establishment of the construction and safety strips	12-3
Table 12-2:	Impacted areas due to the construction of the above-ground facilities	12-3
Table 12-3:	Gap analysis - international vs national requirements for resettlement	12-6
Table 12-4:	Compensation costs for ephemeral agricultural crops for the Iasi-Ungheni Interconnector project	12-14
Table 12-5:	Compensation costs for ephemeral agricultural crops for the Ungheni - Chisinau Pipeline project	12-14
Table 12-6:	Compensation costs for ephemeral agricultural crops for the Ungheni - Chisinau Pipeline project	12-15
Table 12-7:	Purchase (expropriation) costs for land to install the above ground facilities of the Ungheni - Chisinau Pipeline project	12-15
Table 12-8:	Entitlements Matrix for the Ungheni-Chisinau Pipeline Project	12-16
Table 13-1:	Environmental and Social Action Plan for the Ungheni-Chisinau Gas Pipeline Project	13-6
Table 16-1:	Protected mammal species living in the reserve Seliște-Leu	16-2
Table 16-2:	Protected bird species living in the reserve Seliște-Leu	16-2
Table 16-3:	Protected reptile and amphibian species living in the reserve Seliște-Leu	16-3
Table 16-4:	Protected insect species living in the reserve Seliște-Leu	16-4



Table 16-5:	Protected plant species living in the reserve Seliște-Leu	16-4
Table 16-6:	Protected mammal species living in the reserve Plaiul Fagului	16-6
Table 16-7:	Protected bird species living in the reserve Plaiul Fagului	16-8
Table 16-8:	Protected amphibian and reptile species living in the reserve Plaiul Fagului	16-16
Table 16-9:	Protected insect species living in the reserve Plaiul Fagului	16-18
Table 16-10:	Protected plant species living in the reserve Plaiul Fagului	16-19
Table 16-11:	Protected mammal species living in the reserve Cazimir-Milesti	16-26
Table 16-12:	Protected bird species living in the reserve Cazimir-Milesti	16-27
Table 16-13:	Protected amphibian and reptile species living in the reserve Cazimir-Milesti	16-28
Table 16-14:	Protected insect species living in the reserve Cazimir-Milesti	16-29
Table 16-15:	Protected plant species living in the reserve Cazimir-Milesti	16-29
Table 16-16:	Protected mammal species living in the reserve Codrii	16-31
Table 16-17:	Protected bird species living in the reserve Codrii	16-33
Table 16-18:	Protected amphibian and reptile species living in the reserve Codrii	16-41
Table 16-19:	Protected insect species living in the reserve Codrii	16-42
Table 16-20:	Protected plant species living in the reserve Codrii	16-44
Table 16-21:	Investments in dwelling construction per districts	16-50
Table 16-22:	Production of main industrial products	16-50
Table 16-23:	Juices, processed fruits, canned vegetables production	16-50
Table 16-24:	Processed fruits, milk production	16-50
Table 16-25:	Grocery production	16-51
Table 16-26:	Confectionery, pasta production	16-51
Table 16-27:	Wine production	16-51
Table 16-28:	Centralized water supply systems	16-51
Table 16-29:	Centralized water supply systems	16-52
Table 16-30:	Road freight	16-52
Table 16-31:	Transportation	16-52
Table 16-32:	Road infrastructure	16-52
Table 16-33:	Land holder status for districts	16-53
Table 16-34:	Access to school for districts	16-53
Table 16-35:	Access to road for districts	16-53
Table 16-36:	Demographic profile per gender and age aspect, 2013 (Ungheni district)	16-53
Table 16-37:	Ethnicity of Ungheni citizens	16-54
Table 16-38:	Labour status per gender category, 2013 (Ungheni district)	16-54
Table 16-39:	Population access to Electricity, 2013 (Ungheni district)	16-54
Table 16-40:	Average Annual Household Income against Number of Sources, 2013 (Ungheni district)	16-54
Table 16-41:	Residents attending educational institutions, 2015 (Ungheni district)	16-54
Table 16-42:	Residents water supply, 2013 (Ungheni district)	16-54
Table 16-43:	Industrial production, 2013 (Ungheni district)	16-55
Table 16-44:	Average Monthly Income by Sources, 2013 (Ungheni district)	16-55
Table 16-45:	Habitants income status evolution during last 5 years (Ungheni dis.)	16-55
Table 16-46:	Main revenue sources, 2013 (Ungheni district)	16-55

Table 16-47:	Total Average Annual Expenditure of habitants, 2013 (Ungheni district)	16-55
Table 16-48:	Major cropping pattern of households, 2014(Ungheni district)	16-55
Table 16-49:	Average nominal monthly earning per employee, 2013 (Ungheni district)	16-56
Table 16-50:	Demographic profile per gender and age aspect, 2013 (Nisporeni district)	16-56
Table 16-51:	Ethnicity of Nisporeni citizens, 2013	16-56
Table 16-52:	Labour status per gender category, 2013 (Nisporeni district)	16-56
Table 16-53:	Population access to Electricity, 2013 (Nisporeni district)	16-56
Table 16-54:	Average annual household income against number of sources, 2013 (Nisporeni district)	16-56
Table 16-55:	Residents attending educational institutions, 2015 (Nisporeni district)	16-57
Table 16-56:	Residents water supply, 2013 (Nisporeni district)	16-57
Table 16-57:	Industrial production, 2013 (Nisporeni district)	16-57
Table 16-58:	Average monthly income by sources, 2013 (Nisporeni district)	16-57
Table 16-59:	Habitants income status evolution during last 5 years (Nisporeni district)	16-57
Table 16-60:	Main revenue sources, 2013 (Nisporeni district)	16-57
Table 16-61:	Total Average annual expenditure of habitants, 2013 (Nisporeni district)	16-58
Table 16-62:	Major cropping pattern of households, 2014 (Nisporeni district)	16-58
Table 16-63:	Demographic profile per gender and age aspect, 2013 (Calarasi district)	16-58
Table 16-64:	Ethnicity of Calarasi district, 2013	16-58
Table 16-65:	Labour status per gender category, 2013 (Calarasi district)	16-59
Table 16-66:	Population access to Electricity, 2013 (Calarasi district)	16-59
Table 16-67:	Average annual household income against number of sources, 2013 (Calarasi district)	16-59
Table 16-68:	Residents attending educational institutions, 2015 (Calarasi district)	16-59
Table 16-69:	Residents water supply, 2013 (Calarasi district)	16-59
Table 16-70:	Industrial production, 2013 (Calarasi district)	16-59
Table 16-71:	Average monthly income by sources, 2013 (Calarasi district)	16-60
Table 16-72:	Habitants income status evolution during last 5 years (Calarasi district)	16-60
Table 16-73:	Main revenue sources, 2013 (Calarasi district)	16-60
Table 16-74:	Total Average annual expenditure of habitants, 2013 (Calarasi district)	16-60
Table 16-75:	Major cropping pattern by households, 2014 (Calarasi district)	16-60
Table 16-76:	Demographic profile per gender and age aspect, 2013 (Straseni district)	16-60
Table 16-77:	Ethnicity of Straseni citizens, 2013	16-61
Table 16-78:	Labour status per gender category, 2013 (Straseni district)	16-61
Table 16-79:	Population access to Electricity, 2013 (Straseni district)	16-61
Table 16-80:	Average annual household income against number of sources, 2013 (Straseni district)	16-61
Table 16-81:	Residents attending educational institutions, 2015 (Straseni district)	16-61

Table 16-82:	Residents water supply, 2013 (Straseni district)	16-62
Table 16-83:	Industrial production, in 2013 (Straseni district)	16-62
Table 16-84:	Average monthly income by sources, 2013 (Straseni district)	16-62
Table 16-85:	Habitants income status evolution during last 5 years (Straseni district)	16-62
Table 16-86:	Main revenue sources, 2013 (Straseni district)	16-62
Table 16-87:	Total Average annual expenditure of habitants, 2013 (Straseni district)	16-62
Table 16-88:	Major cropping pattern by households, 2014 (Straseni district)	16-63
Table 16-89:	Demographic profile per gender and age aspect, 2013 (Mun. Chisinau)	16-63
Table 16-90:	Ethnicity of Mun. Chisinau citizens, 2013	16-63
Table 16-91:	Labour status per gender category, 2013 (Mun. Chisinau)	16-64
Table 16-92:	Population access to Electricity, 2013 (Mun. Chisinau)	16-64
Table 16-93:	Average annual household income against number of sources, 2013 (Mun. Chisinau)	16-64
Table 16-94:	Residents attending educational institutions, 2013 (Mun. Chisinau)	16-64
Table 16-95:	Residents water supply, 2013 (Mun. Chisinau)	16-64
Table 16-96:	Industrial production, 2013 (Mun. Chisinau)	16-64
Table 16-97:	Average monthly income by sources, 2013 (Mun. Chisinau)	16-64
Table 16-98:	Habitants income status evolution during last 5 years (Mun. Chisinau)	16-65
Table 16-99:	Main revenue sources, 2013 (Mun. Chisinau)	16-65
Table 16-100:	Total Average Annual Expenditure of habitants, 2013 (Mun. Chisinau)	16-65
Table 16-101:	Major cropping pattern of households, 2014 (Mun. Chisinau)	16-65
Table 16-102:	Main informational sources on national level	16-65
Table 16-103:	Cultural, religious and historical sites in the project area	16-67

## Abbreviations and Acronyms

- CC = Construction Contractor
- CO = Carbon Monoxide
- CO<sub>2</sub> = Carbon Dioxide
- CLO = Community Liaison Officer
- dBA = decibel A
- EBRD = European Bank for Reconstruction and Development
- EEE = Ecological Expert Evaluation
- EHS = Environment, Health and Safety
- EIA = Environmental Impact Assessment
- EIB = European Investment Bank
- EIE = Evaluation of Impact on the Environment
- EU NIF = European Union Neighborhood Investment Facility
- ESAP = Environmental and Social Action Plan
- ESIA = Environmental and Social Impact Assessment
- ESMP = Environmental and Social Management Plan
- ESS = Environmental and Social Standard
- EU = European Union
- GDP = Gross Domestic Product
- GIS = Geographical Information Systems
- GPRS = Gas Pressure Regulation Stations
- HDD = Horizontal Directional Drilling
- HSE = Health, Safety and Environment
- IBA = Important Bird Area
- IFC = International Financing Corporation
- IFIs = International Financing Institutions
- IUCN = International Union for Conservation of Nature
- IPOT = The State Planning Institute for Land Management
- LRP = Livelihood Restoration Plan
- MAC = Maximum Allowable Concentration
- MEPIU = Moldova Energy Project Implementation Unit
- MoE = Ministry of Economy of the Republic of Moldova
- MoEn = Ministry of Environment of the Republic of Moldova
- MDL = Moldovan Lei
- NEN = National Ecological Network of the Republic of Moldova
- NO<sub>2</sub> = Nitrogen Dioxide
- NO<sub>x</sub> = Nitrogen Oxides
- OCL = Operational Checklist
- PA = Protected Area
- PAPs = Project Affected Persons
- PCDP = Public Consultation and Disclosure Plan
- PR = Performance Requirement
- RAP = Resettlement Action Plan
- ROW = Right of way
- SHS = State Hydrometeorological Service
- TCD = Tehno Consulting & Design
- TP = Turning Point
- ToR = Terms of Reference
- USSR = Union of Soviet Socialist Republics
- UK = United Kingdom

# 1. Executive Summary

## 1.1 Introduction

Within the context of the Moldova Energy Strategy, Moldova and Romania signed a Memorandum of Understanding on the development and construction of a gas interconnector (Iasi-Ungheni) between the natural gas transmission systems of the two countries and a gas compression station located in Romania. This pipeline has been inaugurated in August 2014. In addition, the Ministry of Economy of Moldova has decided to extend the pipeline for approx. 115 km on the Moldovan side to link Ungheni with Chisinau, the capital and biggest consumption area (the Project).

The European Bank for Reconstruction and Development (EBRD) has been requested by the Ministry of Economy of the Republic of Moldova (MoE, the Developer) to co-finance together with the European Investment Bank (EIB) and the EU Neighborhood Investment Facility (EU NIF) the construction of this new Ungheni-Chisinau gas pipeline.

The EBRD has appointed Fichtner GmbH & Co.KG (the Consultant) to perform an Environmental and Social Impact Assessment (ESIA), presented in this document.

The Ungheni-Chisinau pipeline project is presently in its feasibility stage. As therefore, there is a possibility that the detailed design to be undertaken by the future contractor eventually introduces changes to the routes discussed in this ESIA. The reader shall, as therefore, interpret the routes analysed in this impact assessment as “corridors”. These corridors are relatively flexible - in fact, there are recommendations along this ESIA to deviate the analysed routes at some points to mitigate impacts. The detailed recommendations can be consulted in Section 8 of this ESIA.

In addition, this ESIA has been elaborated in a relatively early stage of the planning, when several technical details have not yet been fixed. This may also imply future changes to some of the dispositions of this report.

Any micro-realignment of the pipeline route, or construction of associated facilities outside the 1,000 meters width investigation area, as well as any deviation or construction that implies entering protected areas or forcing the re-location of buildings, shall be subject to the lenders' prior information and approval.

The present ESIA follows the requirements of the International Financing Institutions (IFIs) and of the Law No. 86 on Environmental Impact Assessment, dated May 29, 2014, of the Republic of Moldova. Following these requirements, some steps have been undertaken for the project in the early stages of the ESIA process, namely:



1. the developer (MoE) prepared an “Application regarding planned activities” containing information about the project and its alternatives, specifying also possible environmental and socio-economic impacts; this has been delivered to the responsible authority (Ministry of Environment - MoEn);
2. the MoEn reviewed the Application and determined that a transboundary EIA for the project in respect of the Espoo Convention would have been potentially necessary, through a process called “Preliminary Assessment”;
3. after being consulted by the MoEn, the responsible environmental authorities in Romania declared not having interest in participating in the ESIA process for the project;
4. the MoEn decided that a national EIA would be necessary for the project;
5. the developer prepared the EIA Program or EIA Scoping, and submitted it to the MoEn for review and approval;
6. at the same time, the Regional Councils of the affected areas have been informed, and, on their turn, these informed the villages under their jurisdiction;
7. the public has also been informed of the EIA Program through newspaper advertisements indicating the possibility to consult and comment the draft document;
8. following the comments’ period, the Scoping Report/EIA Program has been accepted;
9. the ESIA Report has been prepared and is available in the present document.

The expression “Environmental and Social Impact Assessment” (ESIA) is applied preferably by the IFIs, while the expression “Environmental Impact Assessment” (EIA) is used in the EU and the Moldovan legislation. Both will be used alternatively in this report and they have the same meaning in this context.

## 1.2 Project description

The proposed pipeline route starts in the Ungheni district, in the western part of Moldova, and ends in the Chisinau Municipality, located in the central part of the country. Several routing options are under analysis in this ESIA. For all options, the project crosses in addition the districts of Nisporeni, Calarasi and Straseni.

The main components of the Ungheni-Chisinau Pipeline project are:

- Pipeline with a diameter of 600 mm and a length between 113 and 133 km (depending on the routing option);
- 5 Block Valve Stations occupying a fenced area of ca. 100 m<sup>2</sup> each;
- 2 Gas Pressure Regulation Stations (GPRS), one with ca. 800 m<sup>2</sup> and one with ca. 3 ha;

- 6 Pigging facilities, 4 within the areas of the GPRSs, 1 with 100 m<sup>2</sup> in the tie-in to the existing Iasi-Ungheni interconnector, and 1 with 100 m<sup>2</sup> in one of the tie-ins to the Chisinau network.

The design shall be carried out according to the provisions of the construction norms SNiP 2.05.06-85 Main gas pipelines, SNiP 2.04.12 – Strength calculation for steel pipelines, CN 453-73 Norms for land allotment for trunk pipelines, and SNiP III-42-80 Rules for carrying out and handing over the works - main pipes.

The construction of the pipeline will be made according to the following main steps: pre-construction survey, clearing, pipe hauling, stringing, pipe bending, welding and inspection, trenching, lowering, pipeline location survey, hydro testing, backfilling, and finally construction area reinstatement.

It is estimated that 2 temporary workers camps will be necessary for approx. 50 workers, but the exact number and location shall be defined by the construction contractor. Some temporary access roads might be necessary during the construction period. It is estimated that 4 laydown yards with 0,1 ha each will be necessary along the pipeline construction site.

Considering that the water features to be crossed by the pipeline are relatively small/narrow, or have low water levels, open trench/open cut techniques will be used for crossing these.

During construction, a temporary **construction strip** with a total width of 16 meters will be necessary where opening of trenches and deposition of some materials is made, and construction vehicles circulate. On the construction strip the soil will be cleared of all vegetation. This implies that vegetables, cereals, orchards, vineyards, pastures, and forest trees will be affected. Ephemeral agricultural crops and pastures will be affected only during construction, but forest trees, orchards and vineyards will not be re-planted.

To allow the operation of the pipeline, a 50 meters wide **safety strip** or Right of Way (ROW) will be necessary. Above the safety strip, all forest trees, orchards and vineyards need to be cleared.

The pipeline will be operated by Vestmoldtranszgas, which will have the responsibility to ensure a safe and reliable operation of the pipeline, based on the applicable Moldovan regulations.

### 1.3 Legal, institutional and policy framework

The project is expected to be designed, built and commissioned under the respect of national law and international requirements from the financing agency EBRD, as well as from the EIB.

### **Law No. 86 of May 29, 2014 on Environmental Impact Assessment of the Republic of Moldova**

This law is a partial transposition of the Directive 2011/92/EU of the European Parliament and Council from December 13, 2011 on the assessment of the effects of certain public and private projects on the environment. It establishes the principles of EIAs, defines the scope of the EIA, the powers of competent authorities and the application procedure for planned activities.

The EIA Law specifies the main stages necessary for obtaining an environmental permit for the project. Generally, the competent authority shall issue the environmental permit if the environmental impact assessment documentation has been drafted as per requirements and the adverse environmental impact has been minimized.

### **Water law**

This law provides the legal framework for the management, protection and efficient use of surface and groundwater in the country. Chapter IV regulates the water usage permitting procedures. The usage of water for hydrotesting of the Ungheni-Chisinau pipeline shall be subject to a permitting process.

Further, the Water Law forbids the discharge of untreated waste water in the surface or groundwater courses, forcing the construction contractor to establish a proper waste water management on site.

### **Law on environmental protection**

The Law No. 1515-XII provides the basic legal framework for environmental protection in the country, by stipulating the principles of observance of the laws on environmental protection, pollution prevention, and prevention of damages to the biosphere and human health, reduction of water usage, water loss and pollution, as well as reduction of energy consumption.

Article 36 predicts the need for a permanent supervision of construction sites.

### **Law on the fund of natural territories protected by the State**

Also referred to in this ESIA as Law on Protected Areas, this law establishes legal grounds for setting up and functioning of reserves of protected areas.

Section IV respects the buffer zones of the protected territories, which shall be defined to reduce anthropogenic influence on the objects and complexes of the protected territory fund and adjacent areas. Except for the Scientific Reserve Plaiul Fagului, no urbanistic certificates (and as therefore, no buffer) have been defined for any reserve within the project area.

### **Government decision on the creation of the State Natural Reserve „Plaiul Fagului“**

The Government Decision No. 167 of 12.03.1992 establishes the reserve Plaiul Fagului in Ungheni with a total area of 5,642 ha. The main objectives of the creation of the Plaiul Fagului scientific reserve are to protect the environment (conservation, regeneration and ecological recovery), carry out scientific research and provide education and training for the population.

The Decision establishes a protection zone (buffer) with a width of 1,5 km around the boundaries of the reserve. The Ungheni-Chisinau pipeline (Option 1b) is planned to cross this buffer. The installation of pipelines falls within the premises of Article 7, which lists the activities which are „limited“ inside the buffer depending on their distance to the borders of the reserve. It is not clear at this stage what limitations may be caused to the project due to the fact that there is a 100 meters distance to the borders of the Plaiul Fagului reserve. The Ministry of Environment shall evaluate how this Article applies to the project.

### **Red Data Book of Moldova**

The Red Data Book of Moldova is an official document including the list of disappeared, endangered, vulnerable, and rare species of plants and animals of the Republic of Moldova. It includes also general information about their status, condition, distribution, habitat, and methods for their protection.

### **Land allotment for permanent use**

Applicable legislation:

- Government Decree Nr. 1451 on approval of provisions for land allotment, alteration of use and land exchange, 24.12.2007;
- Land Code Nr. 828-XII, 25.01.1991.

Land allotment for permanent use will be necessary for construction of the aboveground facilities in public land. Because the project will be state-owned and managed by a state-owned enterprise, this shall be done free of charge to the state enterprises.

### **Land purchase for permanent use**

Applicable legislation:

- Law Nr. 1308 on normative price for land and sale/purchase procedure, 25.07.1997;
- Government Decree Nr. 958 on temporary methodology of evaluation of estate/land, 04.08.2003.

Land purchase will be necessary for construction of the aboveground facilities in private land. Land can be purchased based on market prices and on normative prices.

### **Land expropriation**

Applicable legislation:

- Law Nr. 1308 on normative price for land and sale/purchase procedure, 25.07.1997;
- Law Nr. 123 on Natural Gas, 23.12.2009.

An authorized authority applying the procedure defined by the effective legislation can expropriate land plots for publicly important purposes, namely for construction, modernization, operation and maintenance of gas networks. In such cases, the compensation can be based on the market prices for land but cannot be less than the normative tariffs specified.

#### **Land allotment for temporary use**

Applicable legislation:

- Land Code Nr. 828-XII, 25.01.1991;
- Law Nr. 123 on Natural Gas, 23.12.2009.

Temporary land withdrawal from agriculture use and forest lands is allowed for installation of gas pipelines, but is subject to the approval of local public management authorities and the consent of the land owners. The land owners are entitled to compensation of losses.

#### **Alteration of the land use category**

Applicable legislation:

- Land Code Nr. 828-XII, 25.01.1991;
- Government Decree Nr. 1451 on approval of provisions for land allotment, alteration of use and land exchange, 24.12.2007;
- Law Nr. 1308 on normative price for land and sale/purchase procedure, 25.07.1997;
- Law Nr. 488 on expropriation for publicly important purposes, 08.07.1999.

If a national importance project shall be build in state owned land, no compensation payment for alteration of land use category is due. The Ungheni-Chisinau pipeline project falls into this category of projects. Because the state needs to buy any private land before constructing the pipeline, an alteration of land use category will be free of charge for the whole project area.

#### **Losses/damages**

Applicable legislation:

- Land Code Nr. 828-XII, 25.01.1991.

Losses caused by temporary use of the land plots, abridgment of rights, or deterioration of land quality (including lost benefits) by other enterprises shall be compensated to land owners who suffered such losses. For each case, damages shall be evaluated separately and they are subject to agreement between the entity intending to use the land plot temporarily and the land owner.

No losses or damages to buildings are expected.

#### **Forest trees**

Applicable legislation:

- Forest Code Nr. 8 87-XIII, 21.06.1996 and amendments.



In Moldova it is not common that forests are planted in private land. For the purpose of the ESIA, and considering the stage of planning of the project, it will be considered that all forests in the project area are public.

### **National Institutional Framework**

The main governmental entities with interest in the environmental aspects of the project are as follows:

- The project's developer and owner, Ministry of Economy (MoE);
- The representative of the MoE for the implementation of the project, MEPIU (Moldova Energy Project Implementation Unit);
- The environmental licensing authority, Ministry of Environment (MoEn), including:
  - the Agency "Apele Moldovei";
  - the Ecological Inspections..

### **EU EIA Directive**

The EU EIA Directive 2011/92/EU applies to a wide range of defined public and private projects, listed in Annexes I and II. The Ungheni-Chisinau pipeline project fits into the criterion of Annex II, meaning that the identification of the need for an ESIA is required through screening. For the Ungheni-Chisinau pipeline project, the screening process was based on an "Application regarding planned activities" prepared by the project's owner (MoE). After analyzing the Application, the MoEn took the decision to request a national EIA for the project. The EIA procedure as depicted in the Moldovan EIA Law follows that of the EU EIA Directive. The procedure was followed for the project.

### **EU Habitats Directive**

The EU Habitats Directive aims to protect and cover habitats, design Special Areas of Conservation and identify species in need of strict protection. Annexes II and IV are directly applicable to the project.

### **EU Birds Directive**

The Birds Directive aims to protect all European wild birds and the habitats for endangered as well as migratory species. Annexes I, II and III are directly applicable to the project.

### **Espoo Convention**

The Convention on Environmental Impact Assessment in a Transboundary Context has been ratified by Moldova in 1994, and Romania in 2001. Because the pipeline route begins close to the border with Romania, there was the possibility that some transboundary impacts would be delivered to this country. The MoEn undertook direct consultation with the environmental authorities in Romania about the project and these determined not to participate on the ESIA process.

### **Bonn Convention**

The Bonn Convention or Convention on Migratory Species (CMS) is the only global convention specialized in the conservation of migratory species,

their habitats and migration routes. Some species covered by the CMS exist in the project area.

### **Bern Convention**

The Bern Convention or the Convention on the Conservation of European Wildlife and Natural Habitats is a binding international legal instrument that aims to conserve wild flora and fauna and their natural habitats, especially those species and habitats whose conservation requires the co-operation of several States. Appendixes I, II and II have relevance for the project.

### **CITES**

CITES or the Convention on International Trade in Endangered Species of Wild Fauna and Flora is an international agreement between governments that aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival. The project area contains some species mentioned in the CITES.

### **International Institutional and Policy Framework**

The European Bank for Reconstruction and Development (EBRD) and the European Investment Bank (EIB) are involved in the Ungheni-Chisinau project as international financing institutions. In addition, funds are granted from the EU Neighborhood Investment Facility (EU NIF).

The EBRD's 2008 Environmental and Social Policy (ESP) includes the adoption of a comprehensive set of specific Performance Requirements (PRs) that clients are expected to meet, covering key areas of environmental and social impacts and issues. An update of this ESP has been published in 2014, but not considered in the present ESIA, which has been contracted and started before that time.

EIB defined a set of 10 Environmental and Social Standards (ESS) which are described in the Environmental and Social Practices and Standards Handbook (2013).

### **International environmental standards**

For the purpose of the ESIA, the EU and the IFC (International Financing Corporation - World Bank Group) standards/limits for water emissions, ambient noise and ambient air concentrations are considered (IFC, 2007, 2007b and 2007c).

### **Gap analysis**

A comparison of the international requirements applicable to the project (EBRD Environmental and Social Policy, EIB Environmental and Social Handbook, and EU EIA Directive) with the EIA legislation of Moldova (Law No. 86 of May 29, 2014) has been undertaken in order to make a gap analysis. This analysis shows that several requirements of the financing institutions are not predicted in the national EIA law nor in the EU EIA Directive (elaboration of an ESMP, description of monitoring requirements, creation of a grievance mechanism, and consideration of pre-construction and decommissioning impacts in addition to those of construction and

operation/maintenance). In these cases, the international requirements of EIB and EBRD apply.

Although the national EIA Law was only partly transposed from the EU EIA Directive, no gaps between the two legal documents have been found in relation to the themes which apply for this project.

## **1.4 ESIA Methodology**

As a first step of the ESIA process, the baseline environmental and social conditions within the project area have been identified by means of: literature review, interviews and meetings with authorities, interviews with inhabitants of the project areas, collection of GIS (Geographical Information System) data and site visits.

The method for assessing the significance of impacts on the environment classifies the impacts according to their scale, duration, severity, certainty, and direction. In addition, it is evaluated whether the impact is direct or indirect, cumulative or not, and if a separate specialist study is needed. Considering these factors, the impact's significance can be classified as Nil or Negligible, Low, Medium, High or Very High. In case mitigation or compensation measures are applicable, the residual impacts are then classified.

The assessment and classification of impacts for the Ungheni-Chisinau project is made in this ESIA for two routing alternatives.

## **1.5 Consideration of alternatives**

A Basic Routing Study has been performed by the IPOT State Planning Institute for Land Management. Three routing options were initially developed with a final common section in the last 13 km: Option 1 (including Option 1b), Option 2 and Option 3.

During the pre-feasibility stage, a comparison of the three routing alternatives from an environmental and social point of view has been made. The basis for the comparison lied on the capacity of the route under study to avoid, or at least, minimize the impacts on the environmental and social features of the areas.

The results showed that Option 3 is the least feasible when considering environmental and social aspects. Both Options 1 and 2 showed advantages in relation to Option 3 and it was difficult at the pre-feasibility stage to determine which from these two was more feasible from an environmental and social point of view. Because Option 1 (including 1b) and Option 2 present comparable advantages and disadvantages, they have been both considered for further assessment as part of this ESIA.

In addition to rejecting Option 3, the results of the Basic Routing Study and the Pre-Feasibility Study pointed the need to undertake modifications to the line routing Options 1 (including 1b) and 2. Measures such as keeping distance to lakes, rivers and villages, shortening the pipe's length, or avoiding eroded areas have been considered for the refinement of the options. Also taken into account was the principle of placing the pipeline as much as possible on arable lands and pastures, and as little as possible on lands occupied by perennial plantations and forest.

Route Option 1 passes ca. 82 m away from a petrol station, which, according to the applicable Moldovan technical rules, is not allowed. Due to this, it is decided to abandon Option 1 and further study Option 1b and Option 2 in the feasibility stage and in the present ESIA.

## **1.6 Environmental and Social Baseline**

### **Physical Environment**

The project area is located in the center of Moldova, one of the smallest European countries. The two project options under study cross five districts: Ungheni, Nisporeni, Calarasi, Straseni, and Chisinau.

The Republic of Moldova is described as generally hilly. It is cut deeply by many streams and rivers. Its altitudes vary between 5 and 430 m. The topography of the project area can generally be described as undulating to hilly. Usually the hill tops are covered with light protected forest.

The main soil type in Moldova and in the project area is chernozem, which is a black-coloured very fertile soil type. Both routing options cross areas of chernozem soil for almost their entire extent. The soil in Moldova is in general affected by pollution, erosion, landslides and degradation.

Moldova has a temperate continental climate characterized by short mild winters, long warm summers and a high level of variability across the country. Climate change is likely to significantly affect Moldova, resulting in impacts on agriculture, as well as on water management. For the project area, high risks of flood increase, soil erosion, salinisation, desertification, agricultural pests, diseases and weeds due to climate change have been identified.

The main source of air pollution in Moldova is the traffic, especially of older vehicles, followed by stationary sources. Within the project area, there are only air quality data available for industrial areas in Chisinau. These show that only NO<sub>2</sub> seems to constitute a problem in the area.

There is no monitoring of noise and vibration in Moldova.

Several aboveground water features are crossed by the pipeline project, or exist in its vicinity: rivers, creeks, artificial lakes, and wetlands (not Ramsar sites).

The project is located within two of the main river basins in Moldova: the Dniester River (in Romanian named Nistru River) basin and the Prut river basin. These rivers account for a significant amount of the potable water supply in Moldova, but do not pass quality standards in many cases. None of these rivers is crossed by the project.

Option 1b runs in parallel to a significant extension (ca. 25 km, including the common option) to one of the tributaries of the Dniester River, the Bîc River. The routing options cross several tributaries of the river Prut (Delia, for example), but they do not cross through or are located within the immediate vicinity of the River Prut.

The project crosses two wetlands or lakes which are not classified as Ramsar sites.

The site visit to the project area was undertaken after a long dry period. Due to this, only little evidence of high groundwater levels has been found.

The landscape in the project area is characterized by the presence of different rivers and floodplains, lakes, roads and railways, hills, marshes, steep slopes, and agricultural fields (ephemeral plantations, vineyards and orchards).

### **Biological Environment**

Several natural ecosystems can be found in Moldova: forest, steppe, meadow, aquatic and paludal ecosystems. From these, the forest ecosystems have the largest expression in the project area. These are mainly composed of oaks, especially pedunculate oak. The floristic diversity determines to a large extent the fauna diversity in forest ecosystems. Forests still maintain a satisfactory environmental capacity for many animal species.

The pre-feasibility and scoping stages of the project allowed the determination and refinement of the route in such a way to avoid to the maximum the crossing of particularly sensitive areas, such as natural protected areas (PA). Table 1-1 shows the closest PA to the project area.

**Table 1-1: Protected areas in the vicinity or within the project area**

Category of PA	Name of PA	District	Approx. distance (km)	Routing option
Landscape Reserve	Temeleuți	Calarasi	0.7	1b
	Căbăiești – Pîrjolteni	Calarasi	1.4	1b
	Voloca Verbca	Calarasi	1	1b
	Cazimir - Milești	Nisporeni	0 (along the border)	1b
	Dolna	Straseni	0.5	2
Natural forest reserve	Seliște-Leu	Nisporeni	Crossed	2
	Cabac	Straseni	0.8	1b/2
Scientific Reserve	Plaiul Fagului	Ungheni	3	1b

Category of PA	Name of PA	District	Approx. distance (km)	Routing option
		Calarasi	2.3	1b
		Nisporeni	0.1 (buffer * is crossed)	1b
Hydrological Natural Monuments	Izvorul lui Ștefan cel Mare	Calarasi	1.8	1b
	Izvoarele nr.1 și nr.2 din satul Nișcani	Calarasi	1.2/1.4	1b
Monuments Geology & Paleontology	Râpa lui Tofan	Calarasi	1.7	1b
	Aflorimentul de gresii și granit de la Cosăuți	Straseni	0.2	1b/2
Landscape Architecture Monuments	Alei de larice și tei. grupuri de conifer	Calarasi	0.6	1b

The table shows that the routing Option 2 crosses the natural forest reserve Seliște-Leu in Nisporeni, and that the routing Option 1b borders the landscape reserve Cazimir - Milești also in Nisporeni. In addition, Option 1b runs nearby (100 m) the Plaiul Fagului Reserve in Nisporeni, crossing its protective buffer as defined in the Government Decision No. 167 of 12.03.1992.

The main objectives of the creation of the **Plaiul Fagului scientific reserve** are to protect the environment (conservation, regeneration and ecological recovery), carry out scientific research and provide education and training for the population. Within this reserve, among the protected mammal species one can find two which are listed in the IUCN Red List as Near Threatened: Speckled Ground Squirrel and Eurasian Otter. The Plaiul Fagului Reserve has an important Bird Area Associated. Several of the bird species within this reserve are listed in Annex I of the Birds Directive (species subject of special conservation measures), others are strictly protected by the Bern Convention, and others are classified as Critically Endangered, Endangered and Vulnerable by the Moldova Red Book and/or the IUCN Red List. Among the protected amphibians and reptiles, one is considered Near Threatened by the IUCN Red List, the European Pond Turtle. The same classification is given to three beetle species. No plant is identified under any level of threat within the IUCN Red List.

The **Cazimir-Milesti landscape reserve** has the objective of allowing the conservation of geographical landscape of national importance, regulating its use for economic, aesthetic, cultural and recreative purposes. Scientific research is carried within the reserve. Only two animal species and no plant species that inhabit this reserve are classified by the IUCN Red List in a level higher than Least Concern. These are the European Turtle Dove (Vulnerable) and the European Pond Turtle (Near Threatened).

The **Natural Reserve Seliște-Leu** has been created with the aim to ensure conditions of optimal protection and restoration of species, plant communities and animals of national importance. There are no plant or animal species within this reserve which are classified by the IUCN Red List in a level higher than Least Concern. There are, however, some nationally protected species.

The **National Ecological Network (NEN)** of the Republic of Moldova is a project implemented by the IUCN and BIOTICA Ecological Society. The Ecological Network identifies areas of high natural value and those that need to be surveyed, as well as sites designated for restoration. Specifically, the following areas are part of the NEN: core areas, ecological corridors, restoration areas and buffer zones. The creation of the NEN has been made under the basis that, if these areas are protected and restored, the remaining natural resources will be protected and continued desertification will be prevented.

The projected pipeline traverses some components of the National Ecological Network, namely,:

- Core areas:
  - Option 1b passes very closely (100 m) to the core area Plaiul Fagului (this core area corresponds to the Scientific Reserve and the IBA with the same name).
  - Option 2 crosses the core area Seliște-Leu (this core area corresponds to the Natural forest reserve Seliște-Leu with the same name);
  - Option 1b borders the core area Cazimir - Milești (this core area corresponds to the Landscape Reserve with the same name);
- Ecological corridors:
  - Both Options 1b and 2 cross one planned national ecological corridor between the core areas Plaiul Fagului and Codrii.

### **Human Environment**

Due to a favorable climate and a fertile ground, Moldova's main products are fruits, vegetables, wine and tobacco. The agricultural sector plays an important role in the national economy, contributing to more than 12% of the GDP.

Over 40.7% of the total area of land is owned by 390,380 individual agricultural producers. This high number of agricultural producers resulted from the privatization process that occurred in the 1990s after the breakdown of the USSR. The Ungheni - Chisinau Gas Pipeline is planned to be built in some of the most fragmented agricultural areas in Moldova.

Land owners without a formal land title but with a valid claim to it are likely to be present in the project area. Such land owners shall register their land in order to facilitate the compensation process. Land owners without a formal land title *and* without a recognizable claim to it (squatters) are entitled, following the international requirements of the financing institutions, to receive compensation for any assets lost, with the exception of land. The

existence of these cases in the project affected area was not confirmed nor rejected during the socio-economic survey. During the detailed design and the survey of project affected people this shall be clarified, and compensation shall be paid in accordance with the methodologies and procedures outlined, including the baseline identification and cut-off dates:

The population in the project area is mainly composed of Moldovans, followed by Ukrainians, Russians, Bulgarians, Roma and Gagauz. The majority of the population has attended at least primary and secondary school.

A large portion of the project's area is cultivated agricultural land. Besides ephemeral crops, perennial agricultural plants are cultivated in the area, namely orchards and vineyards.

Moldova is considered one of the poorest countries in Europe and more than 25% of the population lives below the poverty line. In all districts in the project area there is a significant percentage of the population which has a second income source in order to cover the daily expenses.

Overall in the project area, the access to centralized water supply and sanitation services is below 50%. The Chisinau Municipality, where water supply and sanitation services cover the area almost entirely, is the exception.

Currently all villages in all project districts have 100% access to power.

At present tourism accounts for a relatively insignificant portion in the national economy.

After consultation with local authorities and a site visit, a list of cultural, religious and historical sites in the project area has been obtained. The exact location of these sites is not yet known. This shall be subject of a survey to be undertaken before the construction works begin.

## **1.7 Assessment and mitigation of impacts**

The potential impacts on the natural environment and the socio-economic features of the project area are assessed throughout the construction and operation/maintenance phases. The design phase impacts have been considered during the pre-feasibility stage (selection of alternatives) and the decommissioning impacts are similar in nature to some of the impacts assessed during the construction phase.

The impact assessment is undertaken for **Option 1b** and **Option 2** in a comparative way. The objective is to determine which option shall be further considered for the project.



The assessment of impacts includes as well the determination of mitigation and compensation measures to eliminate or reduce the impacts to the minimum possible.

### **Construction phase impacts and management**

For the project it was considered that the construction activities imply a strip with a width of 16 meters where opening of trenches and deposition of some materials is made, and construction vehicles circulate: **construction strip**.

On the construction strip the soil will be cleared of all vegetation and the topsoil will be removed. This implies that vegetables, cereals, orchards, vineyards, pastures, and forest trees will be affected. Ephemeral agricultural crops and pastures will be affected only during construction, but forest trees, orchards and vineyards will not be re-planted. Construction vehicles and machinery will not be allowed outside the designated areas within the construction strip.

To allow the operation of the pipeline, a 50 meters wide **safety strip** or Right of Way (ROW) will be necessary. Above the safety strip, all forest trees, orchards and vineyards need to be cleared (this will be done during the construction phase).

Since the construction of a pipeline is a linear work, the project area will be affected only locally and temporarily in its different sections (a few weeks per section). For this reason, no section will be affected for the entire duration of the construction period, which significantly reduces the negative impacts of this phase.

The mitigation measures proposed shall be considered within a comprehensive **Health, Safety and Environment Plan (HSE Plan)** to be developed by the contractor before the construction phase begins.

The main impacts identified in the *physical environment* are those related to the **soil**: enhancement of erosion, losses of productivity (due to mixing, compaction and rutting), and losses of quality (due to contamination with waste). Given the importance of agriculture as a mean of subsistence and income in the area, the original high fertility of the soil type available, and its present state of degradation, the negative impacts on this component need to be carefully managed.

The preparation of a Soil Management and Erosion Control Plan and of a Waste Management Plan, the flagging of sensitive areas together with the farmers, the segregation of sub and top soils, the top soil and spoil management, avoidance of site run-off, the waste management on site and the workers camps, among others, are some of the measures that can be undertaken to minimize impacts on soil.

Impacts on the several **water features** that exist in the area can also be expected from the project, especially those derived from crossing. Considering that the water features to be **crossed** by the pipeline are relatively small/narrow, or have low water levels, open cut techniques will

be used for crossing. Even when crossing small rivers, impacts on the aquatic fauna may be expected from sedimentation, disruption of spawning activities, etc.

Discharge and run off of sewage, contaminated storm waters, fuel, engine oil, lubricants, sediments, and the effluent from hydrotesting may also affect the water courses and lakes in the area. If not done in a controlled way, water sourcing for hydrotesting may also adversely affect the water level or flow rate of the surface or underground natural water body chosen.

One way to mitigate impacts on water is planning crossings having into account the characteristics of the rivers to be crossed, i.e, their dimensions, the presence of riparian vegetation, the presence of protected aquatic species, among others. With this information at hand, it will be possible for the contractor to design a Water Crossings Management Plan and keep the crossing impacts to a minimum. Other measures such as preparing a Spill Prevention and Cleanup Plan, follow national or international requirements when sourcing and disposing off the water for hydrostatic testing of the pipeline, among others, are also applicable.

The construction of the pipeline and associated infrastructures will cause gaseous and particulate **air emissions**, as well as cause **noise** nuisance in the adjacent residential areas. Broad impact zones of 350 m and 1,000 m of width from the axis of the pipeline are considered for air quality and noise impacts, respectively. Within these zones, the impacts can be reduced to low significance levels with measures such as: trucks and vehicles crossing housing areas shall reduce their speed to a maximum of 30 km/h, locate generators far from the residential areas, do not store earth and pulverous materials in open air, etc.

Impacts on **landscape** may be felt in a temporary and a permanent way. Temporary impacts are connected to the circulation of heavy machinery and equipment, the presence of piles of material and waste, and the suspended dust. As soon as the construction activities end, all the construction equipment and debris shall be removed and areas not in need for operation shall be restored.

The permanent landscape impacts will be derived from the mandatory clearing for establishment of the construction strip and later of the safety strip. Bushes and trees (vineyards, orchards and forest trees) will not be allowed within the strips and this will cause a disruption of the landscape, especially in the protected area of Seliște-Leu (in Nipsoreni) and potentially also in the landscape reserve Cazimir - Milești (depending on the routing alternative). The construction contractor shall, during the detailed design phase continue optimizing the route in such a way to avoid passage through or proximity to these areas.

On the *natural environment*, the ESIA identified a possibility for impacts on fauna, flora, natural protected areas and, with a lower significance, ecological corridors.

Some of the impacts on **fauna, flora and protected areas** are related to the mandatory clearing activities (and especially the fall of trees) for establishment of the construction and safety strips. Besides a direct loss of flora, the clearing also implies losses of habitats and general disturbances to the area with noise, air emissions and human presence. For the animals, injuries or direct killing may happen due to falls into open trenches. The water crossings may in addition impact aquatic fauna. The protected areas crossed or neighbored by the project (depending on the routing alternative) serve as a habitat for protected and threatened species of animals and plants, which raises the significance of the impacts. None of the project options is expected to impact the functionality of the designated areas, as well as the survival of the species which live/nest/winter within or seasonally pass by these reserves. Specific measures are proposed to prevent impacts on protected animals when crossing the protection buffer of the Plaiul Fagului reserve (Option 1b), or crossing the Seliște-Leu reserve (for Option 2).

The presence of Saker Falcon in the project area could imply the existence of a **Critical Habitat**, a habitat which could be “considered critical by virtue of its importance to the survival of endangered or critically endangered species”. After consultation with experts and analysis of existing data, it is assessed that no Critical Habitat as per EBRD PR 6 (2008) could be significantly affected by the project.

One planned national **ecological corridor** (part of the National Ecological Network) is crossed by the project, and will be blocked during the construction activities due to the presence of workers, machinery and the trenches.

A further optimization of the route in the detailed design phase may avoid impacts on the natural environment, by keeping the route as far away from natural features as possible. In addition, other measures may be considered such as: strictly limit the works to the defined construction strip, fell all trees toward the construction strip to minimize damages to trees in adjacent areas, etc.

On the *human environment*, some of the most significant impacts are those related to **land and property**. These will be unavoidable in the area, as the project crosses several agricultural areas of ephemeral and perennial crops. The impacts of clearing within the construction strip will be temporary for vegetation with short roots, like vegetables, cereals and pastures. For forest trees, orchards and vineyards the impacts will be permanent, as none of these typologies of plants can be re-grown above the pipeline. The land owners shall be thoroughly identified by means of a detailed survey and compensated according to the national law.

Even though a financial compensation shall be provided to the land owners affected by the construction of the pipeline, some measures can be taken to reduce the impacts on the agricultural land. Such measures are related, e.g.,

to avoidance of soil erosion, mixing, rutting and compaction, or restoration of the land to its preconstruction conditions.

No physical resettlement will be necessary for the project, as no buildings are expected to be impacted and no families need to be relocated.

The construction works may temporarily affect the use of the roads, constrain the **access** to properties and can increase the travel time for farmers, local business and general public. The Construction Contractor shall elaborate a Traffic Management Plan to mitigate these impacts.

Public **utilities** which are located under and above ground such as water supply, sewerage, cable network, telephone and power supply can be damaged during construction. The presence of these utilities shall be assessed by the Construction Contractor by means of a survey prior to construction works.

Impacts related to the **workforce** are another important subject within the construction phase, because these may lead to permanent serious consequences, including death. These impacts are connected to: occupational health and safety (falls, electrocution, injuries, exposure to high levels of noise and dust, exposure to toxic substances, etc.), waste management, hygiene, food supply, security, worker's rights, rules and obligations, and employment standards.

In order to minimize negative impacts on the workforce, the Construction Contractor shall abide by the international financing institutions standards. The Moldova Law 186 on Occupational Safety and Health shall equally be followed.

The **community** exposure to health, safety and security risks may be increased during the construction works due to moving heaving vehicles, accidents within the construction site due to non-authorized entrances, exposure to hazardous materials, etc. Within the construction HSE Plan, measures shall be predicted to prevent or mitigate these impacts. Examples are: disclose relevant project-related information to enable the stakeholders to understand these risks and potential impacts; develop accident prevention/emergency preparedness policy and measures, and control the transport safety.

Positive impacts on **economy and employment** may be expected from the construction of the project, although for a short term. The existing experience in Moldova in other construction projects financed by International Financing Institutions shows that local population can be involved in construction works as both skilled and unskilled workforce, at the same time that they strengthen their capacity and knowledge. A potential market for the local agricultural producers and other small businesses like local shops may be created.

The construction of the pipeline in the vicinity of **cultural, historical and archaeological sites, buildings or objects** may cause their destruction, partial or total, or cause irreversible damages. The routing of the pipeline took into consideration the legal distances to the nearest buildings, for what impacts on known buildings of this kind are not expected. However, unknown sites, buildings or objects might be present. For this reason, the construction works cannot be initiated without the obtainment of all relevant permits from the Ministry of Culture. This implies the realization of an archaeological survey previous to the works.

### **Operation phase impacts and management**

The operation of an underground gas pipeline is not expected to entail a large number of potential impacts, as most of the relevant impacts have been delivered during construction.

The mitigation measures proposed shall be considered within a comprehensive **Health, Safety and Environment Plan (HSE Plan)** to be developed by the operator before the operation phase begins.

On the *physical environment*, adverse impacts from pigging may be delivered to the **water** and the **soil**. Cleaning pigs are used to clean any residues resulting from eventual condensation of the gas in the pipeline. This results in a liquid stream to be received at the pig receptor stations that needs to be carefully disposed off.

To avoid spills of the pigging residue, a holding tank or a catcher shall be planned that will receive it when the pig reaches the receiver station. This residue should be discharged only after water-quality testing to ensure that it meets discharge criteria.

**Air quality** impacts may be expected from routine and emergency flaring operations. Pollutants like CO, CO<sub>2</sub>, NO<sub>x</sub>, and unburned hydrocarbons, can be expected from the flaring of the natural gas. In order to avoid the need for flaring, it is important to keep the pipeline in a good maintenance state.

The impacts on the *natural environment* will be connected to the regular clearing of the safety strip, where no **trees** or **vineyards** may grow. If chemical growth control measures or fire are used to clean the strip and keep it clear of any vegetation, impacts on the trees and other vegetation or plantations outside the safety strip may be felt in the area. To avoid this, only biological and mechanical control measures shall be used.

Some temporary negative impacts on **agricultural crops** (partial destruction) could occur during maintenance works and in case of accidents. The landowner shall always be previously informed of any maintenance work to be undertaken, and the works shall be undertaken with due care to avoid damages. The landowners shall be compensated in case of damages.

The potential for impacts on the **community and occupational health & safety** during operation of the pipeline, but in the eventuality of an

emergency or accident these can be of high significance. The operator of the pipeline shall act in accordance with the requirements of Moldova Law 186 on Occupational Safety and Health and international best practices, including e.g, standards for the prevention and control of fire and explosion hazards.

## **1.8 Selection of the routing option**

The assessment of impacts undertaken in Section 8 of this ESIA has been made in a comparative way for both routing options 1b and 2. A summary table of the *qualitative* conclusions is presented in Table 1-2. A *quantitative* comparison of both options can be found in Section 9 of this ESIA, where a numerical classification of each route's impact has been made. The results show that Option 1b is the one which implies less significant negative impacts, although Option 2 would imply a higher positive impact. For this reason, Option 1b has been selected as the preferred route.

**Table 1-2: Qualitative comparison of options**

Component	Phase	Option with higher impact significance	Justification
Soil	Construction	Option 2	Option 2 is longer and affects more erosion prone land and agricultural land.
	Operation	No distinction	The impacts can only be eventually delivered in the pigging facilities, which exist in the same number for both options.
Water	Construction	No distinction	Option 2 implies a larger number of crossings than Option 1b, but it implies a smaller area of possibly affected lakes/reservoirs/wetlands. The extent of possibly impacted rivers is almost the same for both options.
	Operation	No distinction	The impacts can only be eventually delivered in the pigging facilities, which exist in the same number for both cases.
Air quality and noise	Construction and Operation	Option 2	More residential areas are potentially affected with Option 2 than with Option 1b
Landscape - temporary impacts	Construction	Option 2	Option 2 is longer.
Landscape - permanent impacts	Construction and Operation	Option 1b	More trees and vineyards need to be removed and kept cleared with Option 1b.
Terrestrial fauna	Construction	Option 1b	A larger area of forests is expected to be crossed with Option 1b.
Aquatic fauna	Construction	No distinction	Option 2 implies a larger number of crossings than Option 1b, but it implies a smaller area of possibly affected lakes/reservoirs/wetlands. The extent of possibly impacted rivers is almost the same for both options.
Flora	Construction	Option 1b	More trees need to be removed and kept cleared with Option 1b.
Natural protected areas	Construction	Option 2	Option 1b implies the loss of less protected areas than Option 2, and which are less rich in threatened and protected species (Cazimir-Milesti vs Seliște-Leu). The fall of protected trees (Cazimir-Milesti) on the ROW of Option 1b can be avoided (by detailed design), but that of Option 2 (Seliște-Leu)

Component	Phase	Option with higher impact significance	Justification
			cannot.
Ecological corridors	Construction	No distinction	Both options cross the same ecological corridor.
Land and property	Construction	Option 2	Option 2 is expected to affect a larger area of private land and property.
Access and utilities	Construction	No distinction	Both options may imply low impacts.
Occupational and community health & safety	Construction and Operation	No distinction	Both options may imply high to very high impacts.
Economy and employment	Construction	Option 2 (positive)	Option 2 is longer.
Cultural heritage	Construction	No distinction	The lack of precise baseline data does not allow a comparison at this stage.

## 1.9 Environmental and Social Management Plan

The Environmental and Social Management Plan (ESMP) for the Ungheni-Chisinau pipeline project is developed to ensure that all potential impacts are identified and properly mitigated, compensated and monitored throughout the next stages of the project.

The ESMP is presented in Section 10 of the ESIA in a tabular form and it includes:

- The environmental attribute (e.g. air quality) that is likely to be impacted;
- A summary of the potential impact and/or likely issue;
- The identified mitigation and compensation actions that aim to eliminate and/or reduce the potential impact to acceptable levels;
- The compliance and effects monitoring actions to be undertaken;
- The timing and frequency for implementing the mitigation and monitoring actions;
- The responsible entity for implementing the mitigation measures and monitoring actions identified.

This section presents the roles and responsibilities of each of the parties intervenient in the management of the environmental and social aspects of the project during the construction and operational periods, namely:

- MoE/MEPIU - Ministry of Economy/ Moldova Energy Project Implementation Unit
- CEs - Consulting Engineers:
  - Environmental Consultant
  - LRF Consultant
- CC - Construction Contractor
- OC - Operation Contractor



- Governmental authorities:
  - MoEn - Ministry of Environment
  - Central and Raional Environmental Inspections
  - Centre for Public Health
  - Raional Labour Inspections
  - National Archaeology Agency

The environmental attribute to be impacted, as well as the mitigation and compensation measures have been discussed in the previous sections of this Executive Summary. In addition, a set of *compliance monitoring* and *effects monitoring* measures is defined in the ESMP. These may be designed to be applied by the contractors' environmental teams (*self monitoring*), or by external entities (*external monitoring* or auditing), namely the responsible governmental authorities and the Project Owner.

Examples of external monitoring of compliance are: analysis and approval of the HSE Plan for construction/operation by the MEPIU/MoE; verification of any Chance Find Procedure reports by the National Archaeology Agency.

Examples of internal monitoring of effects are: monitoring the grievance mechanism by the construction contractor's HSE team; monitor NOx in the vicinity of the flaring area by the operation contractor's environmental HSE team.

Examples of external monitoring of effects are: verification of the accidents, incidents and breach of legislation reports by the Raional Labour Inspections; verification of the success of any riparian revegetation measures by the MoEn and/or Environmental Inspections.

An Environmental Consultant and a LRF Consultant may be engaged on behalf of the Project Owner to perform the tasks related to monitoring of environmental and social issues.

The requirements to be followed by the construction contractor in the planning and management of the workers camps are also described. These shall respect the EIB's and EBRD's standards, but also other requirements to avoid impacts on the local communities, productive land, traffic, etc.

## 1.10 Public and Stakeholder Consultation

A draft final Public Consultation and Disclosure Plan (PCDP) has been elaborated for the Ungheni-Chisinau Pipeline Project and is available in Annex 16.6. The PCDP describes the strategy and program to be implemented for engaging with the stakeholders of the project in a culturally and timely appropriate manner.

Since the beginning of the ESIA process (including pre-feasibility, inception scoping and scoping stages), consulting and information disclosure activities with some stakeholder groups have been undertaken. Examples are:

- Disclosure of the results of the preliminary assessment of the planned activities in February and March 2015;
- Disclosure of the EIA Program/ToR (publication in newspapers, on official websites, and availability of hard copies), and allowing the possibility for comments in March and April 2015;
- Direct disclosure and consultation during the socio-economic baseline survey undertaken at the project site in May 2015.

The next stages of the ESIA process will further involve the stakeholders by means of a public disclosure of the Draft Final Preliminary ESIA Report. This disclosure will be done with the support of a public debate to be organized in the project area, where the project and the main conclusions of the ESIA will be presented. The public will then be invited to leave their oral and written comments.

During the construction and operation of the project the engagement with the public shall be continued. The main point shall be the development of a grievance mechanism through which project affected people may leave eventual grievances related to the environmental performance of the project, as well as to the compensation process.

About 84% of the population interviewed during the socio-economic baseline survey expressed good attitude towards the project. Although accepting the project, almost 16% of the population showed concerns regarding involuntary land acquisition.

## 1.11 Resettlement Policy Framework

The Ungheni-Chisinau pipeline project will generate involuntary economical displacement. “Involuntary” in this context implies that affected persons and communities do not have the choice to refuse such displacement, and “economical displacement” implies a loss of assets or access to assets that leads to loss of income sources or means of livelihood.

No physical displacement (physical relocation of residence or loss of shelter) will be necessary.

A Livelihood Restoration Framework (LRF) shall be prepared by the MoE once the detailed design of the project is available. The ESIA presents the guidelines to prepare this LRF by means of a Resettlement Policy Framework (RPF).

### **Resettlement impacts and compensation costs**

The Ungheni-Chisinau pipeline project will cross agricultural areas, pasture land, forests and water features. No residential areas, industrial sites and public or private buildings will be affected by the pipeline or in any way by the construction works.

During construction, a temporary **construction strip** with a total width of 16 meters will be necessary where opening of trenches and deposition of

some materials is made, and construction vehicles circulate. On the construction strip the soil will be cleared of all vegetation. This implies that vegetables, cereals, orchards, vineyards, pastures, and forest trees will be affected. Ephemeral agricultural crops and pastures will be affected only during construction, but forest trees, orchards and vineyards will not be re-planted.

To allow the operation of the pipeline, a 50 meters wide **safety strip** or Right of Way (ROW) will be necessary. Above the safety strip, all forest trees, orchards and vineyards need to be cleared. The following areas of losses are expected for Option 1b (the selected option):

- Ephemeral plantations: 116.0 ha
- Pastures: 19.8 ha
- Forests: 39.4 ha
- Orchards: 46.2 ha
- Vineyards: 38.4 ha

The construction of the above ground facilities will imply permanent losses of land, as follows:

- 5 Block valve stations: 0.05 ha of assumed private pasture land
- 2 Pigging facilities: 0.02 ha of private pasture land
- 2 GPRS: 3.08 ha state owned land (includes 4 pigging facilities)

An approximate estimation of the compensation costs of the route Option 1b based on the available data, the legal requirements of Moldova and reasonable assumptions has been made. A total cost of **40,110,066 MDL** or **1,787,627 Euro** is calculated.

### **Legal framework for resettlement and gap analysis**

The national legal framework for (economic) resettlement and compensation has been presented in Section 1.3. A gap analysis with the international applicable requirements (EBRD PR 5 and EIB ESS 6) is undertaken and the results help define the guidelines for resettlement that shall be followed by the MoE in the preparation of the LRF.

### **Guiding principles for resettlement**

- All PAPs will be identified by means of a census, and assisted in improving or regaining their standard of living.
- PAPs will be engaged in all PAP related activities.
- Private land will be purchased for installation of above ground facilities at market price or expropriated at a price not less than the normative price.
- Alternatively, replacement land of equal value will be offered to land owners for installation of above ground structures.
- Land owners without formal land titles but with a claim to the land shall register their land and be compensated before any works begin on their land.

- If informal land owners without a recognizable claim to the land are affected, they shall be compensated for lost assets other than land.
- Before taking possession of the acquired land, compensation and resettlement assistance will be paid.
- An appropriate grievance redress mechanism will be established.

### **Resettlement planning**

In order to conduct the resettlement (economic) process, the following steps are necessary:

1. Undertake a detailed census to: (i) identify persons who will be displaced by the project; (ii) determine who will be eligible for compensation and assistance; and (iii) take inventory of affected land and property.
2. Establish a cut-off date for eligibility claims;
3. Specifically determine the costs of the economical resettlement of the project;
4. Prepare a specific and detailed Livelihood Restoration Framework (LRF) based on points 1 and 3 above;
5. Undertake the delivery of fair, consistent and timely compensation (money or land);
6. Monitor the implementation of the LRF and take corrective actions as necessary;
7. Engage the PAPs throughout the whole process.

### **Monitoring**

The implementation of the detailed LRF shall be monitored regularly to help ensure that it is implemented as planned and that compensation measures are adequate and effective..

Internal monitoring shall be conducted by the MoE, assumed by means of a third party, a LRF Consultant.

### **Grievance mechanism**

A grievance mechanism shall be set up and maintained that will allow prompt addressing of specific concerns about compensation, land acquisition and economic resettlement from the affected people. This grievance mechanism shall be integrated into the one created to address ESIA complains and issues.

The MoE shall inform the affected communities about the grievance process in the course of its community engagement activities and report regularly to the public on its implementation, protecting the privacy of affected individuals. It is advised that a Community Liaison Officer (CLO) is nominated within the MEPIU.

## **1.12 Environmental and Social Action Plan**

In order to fulfill the demands of this ESIA, and in particular of the ESMP, certain actions are required from the different parties of the project. These

actions are described along the report, but are listed and briefly described in the a tabular **Environmental and Social Action Plan (ESAP)** presented in Section 13.

The ESAP lists the HSE sub-plans that shall be developed for the project's construction, namely:

- **Soil Management and Erosion Control Plan:** It shall include measures for avoidance of landslides and severely eroded areas, measures for the cases where this avoidance is not possible, top soil management measures (stripping, preservation), measures to avoid rutting and compaction, and reinstatement measures.
- **Waste Management Plan:** It shall consider basic principles such as waste management hierarchy, segregation, minimization, awareness increase, inspecting and auditing. It shall contain provisions for handling sewage, hazardous waste, excess subsoil (spoil), and recyclable waste.
- **Water Crossings Management Plan:** It will define the water crossings' timing and technique according to the water features' characteristics, based on the results of the Hydrological Survey and the Aquatic Life Survey. The basic objectives will be the avoidance of impacts on aquatic fauna and flora, as well as on any sensitive habitats, and restoration of banks after crossing.
- **Spill Prevention and Cleanup Plan:** It will prevent and remediate water contamination caused by the incorrect disposal or accidental run-off of sewage, fuel, new and used engine oil and lubricants, waste water resulting from washing of vehicles and machinery, and sediments resulting from earth works.
- **Traffic Management Plan:** It will prevent impacts on the mobility and traffic safety of the surrounding communities. It will include as basic measures providing temporary access alternatives, providing community information, and liaising with authorities.
- **Worker's Grievance Mechanism:** It shall constitute an independent grievance management system to enable the workers (and their organizations, where they exist) to raise reasonable workplace concerns. This includes complaints related to non-compliance with health & safety matters, discrimination cases and non-consideration of equal opportunities.
- **Workers' Code of Conduct:** In order to avoid conflicts or other problems with the local populations during construction, the Workers' Code of Conduct shall contain provisions such as "good neighborhood" principle, prohibition of resource to direct conflict, respect for the local religious, cultural, and social activities.

- **Chance Find Procedure:** It will contain provisions for ceasing work as soon as historical and cultural sites, buildings, or objects are encountered during construction. It will include providing relevant information to the Ministry of Culture about the chance find.

Additionally, the HSE Plan for operation shall include an additional specific HSE sub-plan, namely:

- **Emergency Prevention, Preparedness and Response Plan:** plan to include measures involving appropriate public authorities to handle emergency situations which may entail damages to structures (roads, railways) and risks for human life. Establishment of a telephone notification system, and of a pipe location service shall be part of the Plan.

In addition to the HSE sub-plans, the Construction Contractor shall undertake or request the following surveys before the works begin (pre-construction surveys):

- **Landslides and Erosion Survey:** detailed survey of the project area to detect areas of landslides and erosion, specially severe erosion.
- **Hydrological survey:** survey to obtain more detailed information about the surface water features in the area that will allow: making a detailed inventory of all pipeline crossings; determining the dimensions of the water features to be crossed; identifying those features prone to erosion and water channel changes; determining any perennial water features; flagging wetlands.
- **Utilities Survey:** survey to identify the utilities along the pipeline route located under and above ground such as water supply, sewerage, cable network, telephone and power supply can be damaged during construction.

Other pre-construction surveys shall be undertaken by the Project Owner (MoE):

- **Detailed survey of PAPs:** specific site surveys to collect information on the exact affected areas, respective owners (or project affected people, PAP), and determine the compensation mechanisms and costs.
- **Aquatic Life Survey:** survey to obtain more detailed information about the aquatic species that live in or in the surroundings of the surface water features in the area. The main objectives of the Aquatic Life Survey will be to determine the presence of any protected species of fish, birds, mammals, amphibians, reptiles, or insects within the water courses to be crossed; to determine fish spawning, feeding, over-wintering or nursery areas; and to determine the sensitivities of the water courses to be crossed, supporting thereof the development of the Water Crossings Management Plan.

- Birds survey: A Birds Survey shall be undertaken in the protection buffer of the Plaiul Fagului reserve (area crossed by the pipeline). This can be done by verifying the presence of nests which could be used by protected species.
- Trees survey: A Trees Survey shall be undertaken covering the protective buffer of the Plaiul Fagului reserve crossed by the pipeline. The Trees Survey shall visually evaluate the age of the trees; and detect the presence of nests of carpenter bees.
- Archaeological Survey: An Archaeological Survey conducted by a team of archaeologists holding valid archaeological research licenses shall be conducted before the works begin. The construction works cannot be initiated without the obtainance of all relevant permits from the Ministry of Culture, which will be based on the results of this survey.

Any changes to the commitments of this ESIA, the ESMP and the present ESAP motivated by changes in the project's planning and design shall not be undertaken without the previous approval of the Project Owner and the Lenders.

### **1.13 Conclusion**

The ESIA demonstrated that some negative impacts may be expected from the construction and operation of the Ungheni-Chisinau pipeline on the physical, biological and human environment of the project area. However, the establishment and application of HSE Plans for both phases has the potential to avoid or reduce these negative impacts to a minimum, making it possible to construct and operate the project while keeping the environmental and socio-economic sustainability of the area. These HSE plans must be internally and externally accompanied and continuously adapted to the specific and eventually changing conditions on site.

The tendering documents for the Ungheni-Chisinau pipeline project must include the obligation to respect the provisions of this ESIA, the ESMP and the ESAP. In case the provisions of this ESIA are respected, the project may be built and operated under respect of the Moldovan legislation and the policies of the financiers EBRD and EIB on environmental and social matters.

As a final note, it is important to consider that the strict Moldovan technical and security rules have been followed in the feasibility study of the pipeline, as well as in this ESIA. However, a deviation from the Moldovan technical rules for construction of pipelines (distance to petrol stations and size of the ROW) would be favourable in terms of environmental and social impacts, and international safety standards would still be respected.

## 2. Introduction

Within the context of the Moldova Energy Strategy, Moldova and Romania signed a Memorandum of Understanding on the development and construction of a gas interconnector (Iasi-Ungheni) between the natural gas transmission systems of the two countries and of a gas compression station located in Romania. This pipeline has been inaugurated in August 2014. In addition, the Ministry of Economy of Moldova has decided to extend the pipeline for approx. 115 km on the Moldovan side to link Ungheni with Chisinau, the capital and biggest consumption area (the Project).

The rationale of the project is the development of a natural gas transport pipeline connecting Chisinau with the existing Romanian - Moldovan Interconnector Pipeline to increase energy supply security of the country by diversification of supply routes. In addition it is expected to receive cheaper gas from Romania compared to the gas delivered from Russia.

The European Bank for Reconstruction and Development (EBRD) has been requested by the Ministry of Economy of the Republic of Moldova (MoE, the Developer) to co-finance together with the European Investment Bank (EIB) and the EU Neighborhood Investment Facility (EU NIF) the construction of this new Ungheni-Chisinau gas pipeline. The EBRD, the EIB and the EU NIF are described in the report as IFIs (International Financing Institutions).

In order to allow the EBRD and the EIB to make a decision on whether or not to extend finance for the construction of the pipeline, the EBRD has appointed Fichtner GmbH & Co.KG (the Consultant) to perform a feasibility study (FS) of this proposed project (contract No. C29229/SWE2-2014-06-03). **The FS includes an Environmental and Social Impact Assessment (ESIA)**, presented in this document.

The expression “Environmental and Social Impact Assessment” (ESIA) is applied preferably by the IFIs, while the expression “Environmental Impact Assessment” (EIA) is used in the EU and the Moldovan legislation. Both will be used alternatively in this report and they have the same meaning in this context.

The Ungenhi-Chisnau pipeline project is presently in its feasibility stage. As therefore, there is a possibility that the detailed design to be undertaken by the future contractor eventually introduces changes to the routes discussed in this ESIA. The reader shall, as therefore, interpret the routes analysed in this impact assessment as “corridors”. These corridors are relatively flexible - in fact, there are recommendations along this ESIA to deviate the analysed routes at some points to mitigate impacts. The detailed recommendations can be consulted in Section 8 of this ESIA.



In addition, this ESIA has been elaborated in a relatively early stage of the planning, when several technical details have not yet been fixed. This may also imply future changes to some of the dispositions of this report.

## 2.1 Need for an ESIA - Screening

The Law No. 86 on Environmental Impact Assessment, dated May 29, 2014, of the Republic of Moldova came into force in January 2015. This law requires certain steps with respect to the decision on whether an Environmental Impact Assessment (EIA) is required or not for a certain project, as well as its nature. These steps are equivalent to those of the „Screening“ process described in the EU EIA Directive. In summary, the following is necessary:

- The developer assesses whether the project requests a mandatory EIA according to the EIA Law, or if the decision on an EIA shall be subject of a case-by-case analysis;
- The developer prepares an “Application regarding planned activities” containing information about the planned activities and alternatives, specifying also possible environmental and socio-economic impacts (article 8 of the EIA Law);
- The developer files the Application with the Ministry of Environment (MoEn);
- The MoEn reviews the Application and determines the need for an EIA for the project, as well as its nature (national or transboundary) through a process called “Preliminary Assessment” (article 9 of the EIA Law).

The Law No. 86 divides projects into two categories, and lists them accordingly in Appendixes No. 1 and No. 2. The projects listed in Appendix No. 1 require mandatorily an EIA. For those listed in Appendix No. 2, it is necessary to identify the need for an EIA. Specifically for pipeline projects, the appendixes read as follows:

- Mandatory EIA for pipelines with diameters exceeding 800 mm and lengths of at least 40 km for the transportation of gas, petroleum and chemical substances (Appendix No. 1, Nr. 14);
- Identification of the need for an EIA for oil and gas pipeline installations (...) which are not included in Appendix No. 1 (Appendix No. 2, Nr. 10, i).

The pipeline is planned to be more than 40 km long but to have a diameter of less than 800 mm. This means that the criterion of Appendix No. 1 is not fulfilled. Thus, the identification for the need of an ESIA was required.

The Application regarding planned activities was presented by the developer to the MoEn in February 2015. This Application was based on the pre-feasibility study undertaken by Fichtner and approved by the MoE in December 2014.

Based on the Application and in a first step, the MoEn considered that a transboundary EIA would have been potentially necessary. For this reason, and in respect of the Espoo Convention (Section 4.3.4.1 below), the responsible authorities in Romania were informed about the project and asked whether the country wished to participate in the EIA process. The Romanian authorities determined not to participate.

The MoEn decided finally that a national EIA process should be conducted for the Ungheni-Chisinau pipeline project.

## **2.2 The ESIA scoping**

According to the Article 19 of the EIA Law, after the MoEn has made the Preliminary Assessment, the developer shall prepare and disclose the EIA Program. The EIA Program corresponds to the EIA Scoping in the international context. The term “scoping” is defined as “the process of determining the content and extent of the matters which should be covered in the environmental information to be submitted to a competent authority for projects which are subject to EIA” (EC, 2001).

The Draft Scoping Report/EIA Program for the project has been prepared in March 2015 and submitted to the Ministry of Environment for evaluation and approval. At the same time, the Regional Councils of the affected areas have been informed, and, on their turn, these informed the villages under their jurisdiction. The public has also been informed of the EIA Program through newspaper advertisements indicating the possibility to consult and comment the draft document. Please refer to Annex 16.6 for further details.

The Draft Scoping Report/EIA Program presented:

- the technical project details, especially for the construction period (the activities during construction might result in the most significant project impacts);
- the expected project impacts in general terms based on the currently available technical information and baseline data;
- the needed environmental management (mitigation and monitoring) measures;
- a description of the international and national legal framework applicable to the project;
- the recommended Terms of Reference for the current step, the EIA.

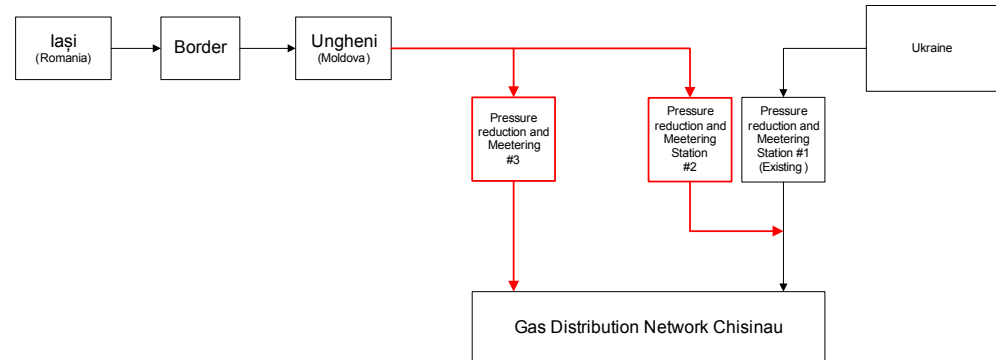
Comments from the Ministry of Environment to the draft Scoping Report/EIA Program have been received. The comments referred to some information which was missing on the draft report, namely: an updated time schedule of implementation of the EIA; the confirmation of the distribution of the Draft EIA Program to the local authorities; the comments from the local authorities; the confirmation of publications on newspapers. The requested information was sent to the MoEn and the Scoping Report/EIA Program has been finally accepted in June 2015.

The methodology and focus of the present ESIA is based on the results of the above described scoping process.

### 3. Project Description

The Ungheni-Chisinau Natural Gas Pipeline can be seen as extension of the existing Romanian-Moldovan Interconnector Pipeline. The new pipeline will tie-in into the existing Interconnector close to Ungheni and will transport the gas to Chisinau.

A sketch of the relevant pipeline system is given in Figure 3-1. The sections which are subject of this project are marked in red.



**Figure 3-1: Sketch of the Pipeline System**

The main components of the Ungheni-Chisinau Pipeline project are:

- Pipeline;
- 5 Block Valve Stations;
- 2 Gas Pressure Regulation Stations (GPRS);
- 3 Pig Launcher Stations;
- 3 Pig Receiver Stations.

#### 3.1 Pipeline

The design of the Pipeline is characterized by the following parameters:

- |                           |   |
|---------------------------|---|
| • Pipeline Diameter       | DN 600  |
| • Length                  | between 113 and 133 km                        |
| • Max. operation pressure | 50 bar  |
| • Design pressure         | 55 bar  |
| • Peak capacity           | approx. 235.000 Nm <sup>3</sup> /h (at 15 °C) |

For high pressure gas pipeline design and construction, the design shall be carried out according to the provisions of the construction norms SNiP 2.05.06-85 Main gas pipelines, SNiP 2.04.12 – Strength calculation for steel pipelines, CN 453-73 Norms for land allotment for trunk pipelines, and SNiP III-42-80 Rules for carrying out and handing over the works - main pipes.

The pipeline, valves and fittings shall be protected against external corrosion by protective coatings. The pipeline may be externally coated with HDPE (High Density Polyethylene) or PU (Polyurethane) coating system. Field joints and factory made pipe bends shall be protected with polyurethane. Pipeline block valves and other buried fittings shall be coated with polyurethane as applicable.

The pipeline will be internally lined with an epoxy lining to improve the flow properties and prevent corrosion during storage and operation. The value for internal surface roughness, as used in the hydraulic model of the line pipe (k), will initially be assumed to be 0.05 mm.

Cathodic protection for the pipeline shall be based on an impressed current system which shall have a 25 year design life from the completion of system commissioning. All equipment and materials shall be designed for this design life as a minimum. It is anticipated that part replacement of the system including ground bed and power supplies will be required to achieve a 40 year design life similar to the pipeline.

## **3.2 Above Ground Installations**

Above ground pipeline ancillaries include those units and items, other than the pipeline itself, required for the successful operation of the pipeline.

### **3.2.1 Block Valve Stations**

Five block valve stations occupying a fenced area of ca. 100 m<sup>2</sup> each are predicted for the project. In the present planning stage their location is not known. The valve design shall be suitable for 40 years.

The primary functions of a block valve include:

- Isolating sections in the event of pipeline damage, leak or rupture;
- Blowing off gas of isolated sections;
- Limiting the amount of natural gas lost during pipeline section shutdown.

### **3.2.2 Gas Pressure Regulation Stations (GPRS)**

Gas Pressure Regulation Stations (GPRS) are necessary to adjust the pressure of gas coming from the transmission pipeline and going to the distribution network.

For the project, 2 GPRS are planned: new GPRS#2 and new GPRS#3 (the GPRS#1 already exists). The new GPRS#2 will have approximately 800 m<sup>2</sup> of land area. An operation/administration/maintenance (OAM) complex shall be constructed at the area where GPRS#3 will be located including: building(s) for offices, the dispatch centre, laboratories, repair and maintenance workshops, warehouses, and garage. Emergency stocks of

pipes and parking area for vehicles and machinery will need outdoor areas. Altogether an area of 3 ha is envisaged for the complex.

### 3.2.3 Pigging Facilities

4 pigging facilities are predicted to be located within the areas of the Gas Pressure Regulation Stations (new GPRS#2 and new GPRS#3). Two additional pigging facilities shall be constructed: one in the tie-in to the existing Iasi-Ungheni interconnector, and one in one of the tie-ins to the Chisinau network. For each of these two additional facilities, an area of 100 m<sup>2</sup> is necessary to be made available. For those four facilities located within the GPRS, additional acquisition of land is not necessary.

The pipeline, including pig traps, shall be designed to accommodate conventional as well as intelligent pigs. The pipeline minimum bend radius shall not be less than five times the pipe diameter (5D) to allow smooth pigging.

Permanent pig traps shall be installed for the pre-commissioning, commissioning and decommissioning of pipelines, cleaning during maintenance periods, inspection with intelligent pigs and pipeline repairs, if required.

## 3.3 Detailed design

The description and location of the project components shown in this Section is based on the results of the Feasibility Study (Fichtner and IPOT, 2014). The future contractor shall, based on the Feasibility Study and this ESIA, undertake the detailed design of the pipeline routing, as well as define the definitive location and size of the above ground facilities, including access roads and workers camps. During the detailed design process, there is a possibility that changes are introduced to the routes (and other technical issues) discussed in this ESIA.

Any micro-realignment of the pipeline route, or construction of associated facilities outside the 1,000 meters width investigation area, as well as any deviation or construction that implies entering protected areas or forcing the re-location of buildings, shall be subject to the lenders' prior information and approval.

## 3.4 Pre-construction

Once the pipeline route is finalized, the construction contractor undertakes a pre-construction survey, during which the location of drainage lines and linear utilities (pipes, telecommunication cables, electrical cables, etc.) is identified and marked on the land.

Next, the pipeline's centerline, the Right of Way boundaries, the access roads routes, and the workers camps and laydown areas are staked, and the clearly marked areas are cleared of any vegetation. Temporary erosion control measures may be applied where necessary prior to any earth-moving activities. The cleared areas are then leveled and graded to provide access for construction equipment.

The number and location of the temporary workers camps for the Ungheni-Chisinau pipeline project shall be defined by the construction contractor once manpower and logistics planning is completed. It is estimated that 2 camps will be necessary for the whole extension of the pipeline, one every 60 kms. Some temporary access roads might be necessary during the construction period. It is estimated that 4 laydown yards will be necessary along the pipeline construction site. Each of these yards shall have 1000 m<sup>2</sup> or 0,1 ha.

### 3.5 Construction

For the project it is considered that the construction activities imply a strip with a width of 16 meters where opening of trenches and deposition of some materials is made, and construction vehicles circulate: **construction strip**. On the construction strip the soil will be cleared of all vegetation and the topsoil will be removed. This implies that vegetables, cereals, orchards, vineyards, pastures, and forest trees will be affected. Ephemeral agricultural crops and pastures will be affected only during construction, but forest trees, orchards and vineyards will not be re-planted.

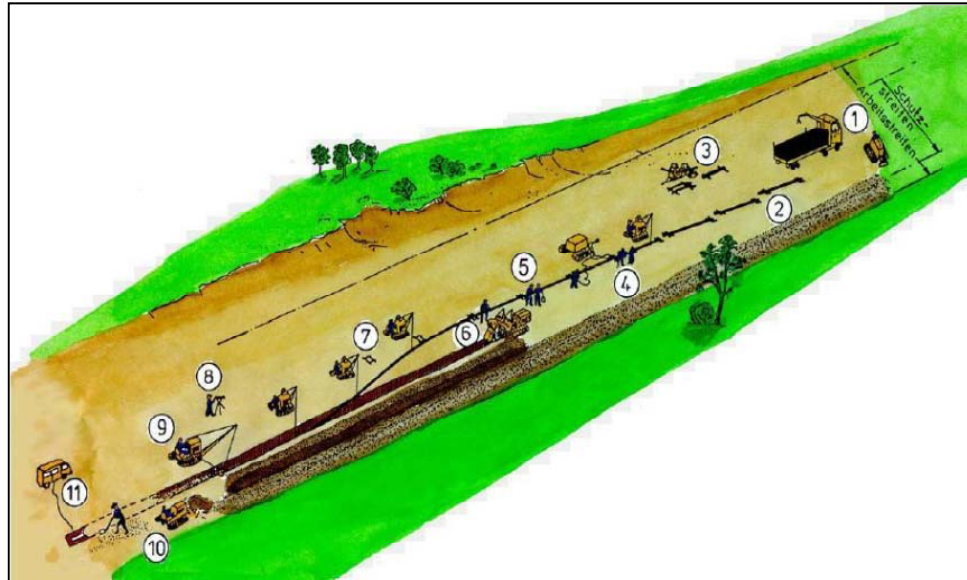
To allow the operation of the pipeline, a 50 meters wide **safety strip** or Right of Way (ROW) will be necessary. Above the safety strip, all forest trees, orchards and vineyards need to be cleared (this will be done during the construction phase).

The construction of a pipeline can be compared to a moving assembly line. The construction of a pipeline is typically broken down into separate tasks utilizing highly specialized workgroups. These workgroups work on one side independently on their own task but on the other side hand in hand to accomplish construction in a timely manner. Each of the workgroups therefore has its own crew with their own responsibilities. As one workgroup completes its work part, the next crew takes moves into position to complete their responsibility.

The associated activities related to the construction of a pipeline are listed below. The numbers in brackets indicate the activity shown in Figure 3-2.

- Clearing construction area (vegetation and topsoil) (1) (pre-construction activity)
- Pipe Hauling (2)
- Stringing (4)
- Pipe Bending (3)
- Welding and Inspection (4) (5)

- Trenching (6)
- Lowering (7)
- Pipeline location survey (8)
- Hydro testing (11)
- Backfilling (9)
- Construction area Reinstatement, including replacement of topsoil (10)



**Figure 3-2: Construction of a Pipeline**

Before actual construction work can begin, the clearing of the safety strip or Right of Way, including construction strip has to be done. Within the construction strip, besides clearing the vegetation, the topsoil is removed and stockpiled separately. The pipes are hauled along the cleared strip and where necessary bending is performed. The next step is stringing the pipe along the trench. The pipes are lined up end to end to allow welding into strings. Each weld undergoes nondestructive testing, the coating is inspected. Excavation is performed with backhoes or trenching machines to excavate a pipeline trench. The soil that is excavated during ditching operations is temporarily stockpiled. Then the pipe is off-loaded from trucks and placed next to the trench using a side boom tractor. Backfill follows shortly after lowering the pipe. Fine grade material, free from sharp edged stones, should be used and carefully compacted around the pipe to cover it. After backfilling, the pipeline is hydrostatically tested.

Construction area reinstatement involves the cleaning and restoration of the work area and plantation including markers, etc. The replacement of topsoil is included within the reinstatement activities and shall be made under the guidelines defined later in this ESIA (under Section 8.1.1.1 and the ESMP). Disturbed areas are restored as close as possible to their original contours.

### 3.5.1 Crossing of rivers, lakes and wetlands

The crossing of surface water features is a challenging matter from a technical and an environmental point of view. Considering that the water



features to be crossed by the pipeline are relatively small/narrow, or have low water levels, **open cut techniques** will be used for crossing. Open cut crossings consist of digging an open trench in the stream bottom, laying the prefabricated length of pipe necessary to reach bank to bank and then backfilling (DEGT, 2006). Open cut techniques may be further divided into “wet ditch” or “dry ditch”.

In **open-cut wet ditch** crossing methods, there is no diversion of the stream, i.e., the pipe is installed and backfilled while the stream continues to flow. This can be done in small rivers or in larger rivers with little or no water at the time of crossing. It has the benefits of providing a low cost and quick solution. It has, however, the disadvantage of creating a potentially significant sediment runoff. This increases the total suspended sediments in the water and may cause changes in the channel’s morphology and impact aquatic life.

In **open-cut dry ditch** crossing methods, the stream is isolated and diverted. The isolation may be made by means e.g. of sand bags placed both upstream and downstream the crossing spot. Then the stream is diverted using a **flume pipe** or by transferring the water across the site by means of a temporary **pipe and pump**. Open-cut dry ditch methods are usually more expensive and time consuming than open-cut wet ditch methods. However, they cause less sediment yield and, as therefore, less impacts on the river’s morphology and aquatic life.

The techniques to be used in the project shall be detailed in a Water Crossing Management Plan to be elaborated by the Construction Contractor. This plan shall be approved by the MoEn and the lenders before the works begin. Environmental sensitivities of the rivers to be crossed will be assessed and will constitute an important factor in developing specific crossing methods. Please refer to Sections 8.1.1.3 and 10.2 of this ESIA for further details.

### 3.6 Commissioning

After the completion of the pipeline construction works, the commissioning and start-up will be executed. The commissioning includes the introducing of natural gas into the pipeline and the testing of all systems. Personnel from the operating company will be involved during the entire process. After successful testing and remedy of all identified defects, the pipeline will be handover to the operating company.

### 3.7 Operation and Maintenance

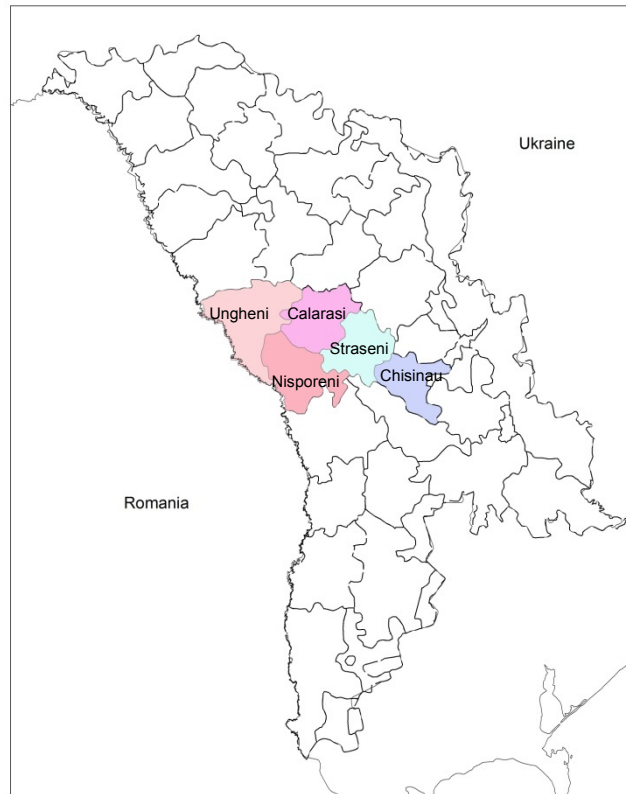
The pipeline will be operated by Vestmoldtranszgas. After the handover of the pipeline, the pipeline operator has the responsibility to ensure a safe and reliable operation of the pipeline, based on the Moldovan regulations for pipeline operation.

To ensure a good condition of the system, the operator is obliged to continuously inspect the pipeline by means of pigs, which will be sent through the pipe and by gas leakages inspections above ground with the help of gas leakages detection equipment. It is the responsibility of the operator to operate the pipeline within the design limits.

In case of an emergency the operator will act according to the emergency plan in order to immediately mitigate the damages of the equipment and to minimize the risk for the eventually affected people and environment.

### 3.8 Project's location

The proposed pipeline route starts in the Ungheni district, in the western part of Moldova, and ends in Chisinau Municipality, located in the central part of the country. The project crosses in addition the districts of Nisporeni, Calarasi and Straseni (Figure 3-3).



**Figure 3-3: Districts within the project area**

The project area is characterized by the presence of different rivers, creeks, floodplains, wetlands, lakes, roads and railways, hills, marshes, steep slopes, and agricultural fields (ephemeral plantations, vineyards and orchards). Forest ecosystems have some expression in the project area, being mainly composed of oaks, especially pedunculate oak.

One of the project options is expected to cross the natural forest reserve Seliște-Leu, in Nisporeni (included in the core area Seliste - Leu) . Another option is planned to border the landscape reserve and core area Cazimir -

Milești in Nisporeni and to run nearby the Plaiul Fagului reserve and core area in Nisporeni. The Plaiul Fagului reserve has an important Bird Area associated. All options under consideration cross one planned national ecological corridor.

A large portion of the highly fragmented project's area is cultivated agricultural land. Besides ephemeral crops, perennial agricultural plants are cultivated in the area, namely orchards and vineyards.

A more detailed description of the project area can be consulted in Section 7 of this ESIA.

## 4. Legal, institutional and policy framework

The project is expected to be designed, built and commissioned under the respect of national law and international requirements from the financing agency EBRD, the EIB and the EU NIF.

This Section presents a list and a summary of the most relevant national legal documents applicable to the project, the EBRD's Environmental and Social Policy (2008), the EIB's Environmental and Social Practices and Standards Handbook (2013), the EU EIA Directive, and several conventions to which Moldova is signatory/party to. In addition, a gap analysis between the international and the national requirements is undertaken, and recommendations are made to overcome the gaps encountered.

The national and international institutional framework with relevance for the ESIA process is in addition described.

### 4.1 National Legal Framework

#### 4.1.1 Law on Environmental Impact Assessment

During the last 20 years the Republic of Moldova has renewed the legal environmental framework in many aspects. In 1996, the Law on Ecological Expert Evaluation (EEE) and the Evaluation of Impact on the Environment (EIE) was passed in the Republic of Moldova. This Law attempted to integrate the existing system of ecological expertise with the more “western” model of environmental impact assessment.

Recently, this law was replaced by the Law No. 86 of May 29, 2014 on Environmental Impact Assessment, whose effective date was January 4, 2015. This law is a partial transposition of the Directive 2011/92/EU of the European Parliament and Council from December 13, 2011 on the assessment of the effects of certain public and private projects on the environment.

The Law No. 86 establishes the principles of EIAs, defines the scope of the EIA, the powers of competent authorities and the application procedure for planned activities. Arrangements for the execution of a Preliminary Assessment of planned activities, the procedure for EIAs in a transboundary context for the party of origin / the affected party, as well as the procedure of EIAs at the national level are explained. The law regulates the informing processes of the approval, responsibilities and challenge of decisions.

The Law Nr. 86 specifies the following main stages for obtaining of an **Environmental Permit**:

1. The developer analyses whether the project is referred to in the EIA Law as one mandatorily requiring an EIA or as one eventually requiring an EIA;

2. The developer prepares an “Application regarding planned activities” containing information about the planned activities and alternatives, specifying also possible environmental and socio-economic impacts (article 8 of the EIA Law);
3. The developer files the Application with the Ministry of Environment (MoEnv);
4. The MoEnv reviews the Application and determines the need for an EIA for the project, as well as its nature (national or transboundary) through a process called “Preliminary Assessment” (article 9 of the EIA Law).
5. The developer undertakes the EIA and the respective public consultation process according to the dispositions of the law and following the contents described in Article 20;
6. Based on the outcomes of the review of the EIA, of the opinions issued by the central and local public authorities, and by other institutions concerned, taking into account as well the written comments submitted by the public and the findings of the public consultations, the competent authority shall approve one of the following decisions:
  - a) to issue the environmental permit;
  - b) to return to the developer of the planned activity the environmental impact assessment documentation for finalization;
  - c) to decline the issuance of the environmental permit.

The competent authority shall issue the environmental permit if the environmental impact assessment documentation has been drafted as per requirements and the adverse environmental impact has been minimized (Article 23(2)).

The environmental permit shall be valid for 4 years. If upon expiry of the above mentioned timeframe the developer has not obtained the permit for the implementation of the planned activity, it shall recommence the entire process of environmental impact assessment, starting with filing the Application (Article 23(7)).

For the Ungheni-Chisinau pipeline project, the steps 1 to 4 have been fully undertaken. The present report represents the results of step 5.

#### 4.1.2 Water Law

Moldova’s Water Law (Law No. 272 of 23.12.2011) replaced the outdated Water Code and entered into force in October 2013. The purpose of the law is to create a legal framework for the management, protection and efficient use of the surface water and groundwater in the assessment, planning and participatory decision process. In addition, it creates mechanisms for protection, prevention of degradation, prevention of further deterioration and restoring of aquatic habitats using the European requirements as a basis.

Chapter IV of the Water Law regulates the water usage permitting procedures. According to this law, all uses of water which do not include human consumption, domestic needs, animal needs, irrigation next to

houses, and storage for firefighting or emergencies are classified as „special use of water“, and imply the application for an environmental permit (Article 23). An environmental permit is always mandatory for usage of groundwater (Article 45). Given these requirements, the usage of water for hydrotesting of the Ungheni-Chisinau pipeline shall be subject to a permitting process (please refer to further details in Section 8.1.1.3).

The discharge of untreated waste water in the surface or groundwater courses is forbidden as per the Water Law (Article 34). The construction works shall abide by this, and a proper waste water management shall be predicted on site (further details are available in Section 8.1.1.3).

#### 4.1.3 Law on environmental protection

Moldova's Law on environmental protection (Law No. 1515-XII of June 16, 1993) provides the basic legal framework for environmental protection in the country, covering the principal environmental components as well as biological diversity, waste toxic substances and plant protection. Its goals are:

- to ensure a healthy, prodigious and esthetically pleasant environment for all citizens;
- to avoid the degradation, exhaustion and damage of natural resources;
- to protect the soil, the underground, water and air from pollution which violates the natural equilibrium;
- and at last the reconstruction of ecologic systems and their components damaged by anthropogenic activity or by natural disasters (Article 2).

The law stipulates the following principles: observance of the laws on environmental protection, pollution prevention, and prevention of damages to the biosphere and human health (Article 3). Reduction of water usage, water loss and pollution, as well as reduction of energy consumption are shall be achieved by those conducting economic activities (Article 8).

Other articles of the Law with importance for the Ungheni-Chisinau pipeline project are:

- Article 35: predicts that any damages delivered to the environment shall be compensated, although no further details concerning this subject are available;
- Article 36: predicts the need for a permanent supervision of construction sites, and for taking operative measures to tackle delivered negative impacts.

#### 4.1.4 Law on the fund of natural territories protected by the State

The Law No. 1538 XIII of 25<sup>th</sup> February 1998 on the fund of natural territories protected by the State (Law on Protected Areas) establishes legal grounds for setting up and functioning of reserves of protected areas, principles, mechanisms of conservation thereof, and also competence and

plenary powers of central and local authorities, non-governmental organizations and citizens in the aforesaid sphere.

Section IV respects the buffer zones of the protected territories. The most important articles from this section read as follows:

- Article 83:
  - (1): to reduce anthropogenic influence on the objects and complexes of the protected territory fund and adjacent areas buffer zones are established. The borders of the buffer zones are to be established in urban development and arrangement documentation and to be approved by the Government;
  - (2): the width of the buffer zones for the various categories of objects and complexes of the protected area fund is to be as follows:
    - a) For research reserves, national parks and biosphere reserves - 100-500 m
    - b) For natural landmarks: geological, paleontological, hydrogeological, zoological, botanical landmarks and complexes - 500-1000 m; ancient trees and rear plants – 30-50 m
    - c) For natural, landscape and resource reserves, territories of multifunctional use - 700-1000 m;
    - d) For dendrology gardens, special gardens and parks and zoos – 100-150 m;
    - e) For swamplands of international value – 1000-1500 m.
- Article 85: in the buffer zones is allowed:
  - a) Implementation of normal economic activities, which do not cause the change of the course of natural processes;
  - b) Creation of optimal conditions for habitation of wild animals,
  - c) Sanitary cutting, cutting for plants handling and forest regenerating cuttings,
  - d) Arrangement of separate areas for regulated recreation.
- Article 86: in the buffer zones is forbidden:
  - a) Hunting, fishing and unauthorized trapping of animals;
  - b) Clear cutting of forests;
  - c) Construction of storages for toxic chemicals and fertilizers and other auxiliary facilities;
  - d) Application of pesticides;
  - e) Construction and placement of fueling stations and facilities for preparation of chemical solutions and for storing of petroleum products, boiler houses, accumulators for discharge waters, maintenance stations, laundries, industrial and agriculture facilities which can have devastating influence on the environment.

Several protected areas exist within the surroundings of the project area, as shown in Map No. 8 in Annex 16.7 and discussed in Section 7.2 of this ESIA.

After consultation with several national authorities (Moldsilva, the Ministry of Environment, the Institute of Ecology and Geography, and the Ministry of Regional Development and Construction), Fichtner has been informed that, except for the Scientific Reserve Plaiul Fagului, no urbanistic certificates (and as therefore, no buffers) have been defined for any reserve within the project area.

The Law on Protected Areas classifies the species that can be found within the protected territories into:

- I - Extinct;
- II - Endangered;
- III - Vulnerable;
- IV - Rare;
- V - Undetermined status;
- VI - Not anymore under risk of extinction;
- VII - Poorly understood;
- VIII - Not threatened.

This classification follows the one used by the IUCN's Red List.

#### 4.1.5 Government decision on the creation of the State Natural Reserve „Plaiul Fagului“

The Government Decision No. 167 of 12.03.1992 establishes the reserve Plaiul Fagului in Ungheni with a total area of 5,642 ha. The main objectives of the creation of the Plaiul Fagului scientific reserve are to protect the environment (conservation, regeneration and ecological recovery), carry out scientific research and provide education and training for the population.

The Decision establishes a protection zone (buffer) with a width of 1,5 km around the boundaries of the reserve, depending on the contours of natural boundaries, roads, farmland and villages. The objective of the buffer is to reduce the anthropogenic activity in the territory adjacent to the reserve.

Article 6 lists the forbidden activities within this buffer:

- Hunting, fishing and trapping animals without special authorization;
- Forest cuttings, except reconstruction cutting and sanitary cutting;
- Construction of facilities for storage of toxic chemicals and fertilizers, as well as other objects that can cause damage to the flora and fauna of the reserve;
- To park in places other than those indicated.



Article 7 lists the activities which are „limited“, depending on the distance from the borders of the reserve:

- Application of pesticides;
- Construction of buildings and other objects;
- Installing pipelines and other communication lines.

The Ungheni-Chisinau pipeline (Option 1b) is planned to pass ca. 100 meters away from the Plaiul Fagului Reserve, meaning that the defined 1,5 km buffer would be disturbed.

The installation of pipelines falls within the premises of Article 7 of the Government Decision No. 167, which lists the activities which are „limited“ inside the buffer depending on their distance to the borders of the reserve. It is not clear at this stage what limitations may be caused to the project due to the fact that there is a 100 meters distance to the borders of the Plaiul Fagului reserve. The Ministry of Environment shall evaluate how this Article applies to the project. Details about this impact can be read in Section 8.1.2 of this ESIA.

#### 4.1.6 Red Data Book of Moldova

The Red Data Book of Moldova is an official document including the list of disappeared, endangered, vulnerable, and rare species of plants and animals of the Republic of Moldova. It includes also general information about their status, condition, distribution, habitat, and methods for their protection. In more detail, the animal and plant species are classified into different classes as follows:

- Extinct (EX): the species has not been found in the past 30 years;
- Critically endangered (CR): the species is threatened with extinction from the native habitat in the near future;
- Endangered (EN): the species is in danger of extermination, and its survival is unlikely if external factors continue to influence its condition;
- Vulnerable (VU): the species is in risk of becoming under threat of extinction if external factors negatively influence its condition;
- Rare (R): the species is not under threat, but it exists in a reduced number of individuals;
- Indeterminate (I): the species belongs to one of the categories, but the information is insufficient to determine to which one.

The Law No. 325 of 15.12.2005 regulates the protection, use and restoration of the species of animals and plants included in the Red Data Book. Article 9 of this law states that species of plants and animals included in the Red List of the IUCN can be included in the Red Data Book of Moldova, but they may be assigned a different status under national and international law. This is the case for many species listed along this ESIA.

#### 4.1.7 National legal framework for land acquisition and compensation

The pipeline will be constructed underground. The required land for construction activities above and around the pipeline axis will not be purchased, as the disturbances will be only temporary. The damages and losses (such as losses of harvests) shall be compensated to the owner. The land required for the permanent above ground facilities shall be purchased.

The actual land acquisition procedures was not started during the Feasibility Study. Negotiations with land owners was not conducted. The final land allotment and cost calculations shall be made by a specialized institution before construction begins.

The main legislation for land allotment, land sale/purchase and compensation of damages/losses is as follows:

- Land code Nr. 828-XII (25.01.1991);
- Forest code Nr. 887-XIII (21.06.1996) and amendements;
- Law Nr. 247-XII on state land management, state cadastre and land monitoring (22.12.1992);
- Law Nr. 1308 on normative price for land and sale/purchase procedure (25.07.1997);
- Law Nr. 488 on expropriation for publicly important purposes (08.07.1999);
- Law Nr. 123 on Natural Gas;
- Government Decree Nr. 1451 on approval of provisions for procedure of land allotment, alteration of use and land exchange (24.12.2007);
- Government Decree Nr. 958 on temporary methodology of evaluation of estate/land, 04.08.2003

For construction of the main gas pipeline Ungheni-Chisinau it will be necessary to deal with issues of:

- Land allotment and purchase for permanent use, land expropriation;
- Land allotment for temporary use;
- Alteration of land use category;
- Compensation of losses of and damages to:
  - Ephemeral plants;
  - Perennial plants;
  - Other assets.

##### 4.1.7.1 Land allotment and purchase for permanent use, land expropriation

Land allotment and purchase for permanent use will be necessary for construction of the aboveground facilities of the gas pipeline Ungheni-Chisinau. They include:

- Block valve stations, which shall distance from each other not more than 30 km; a number of 5 is planned, occupying an area of ca. 100 m<sup>2</sup> each.
- Two gas Gas Pressure Regulation Stations (GPRS) occupying an approximate area of 800 m<sup>2</sup> (40 m x 20 m) and 3 ha, respectively.
- An area for storage of spare parts, pipes, machinery and maintenance shops to be included within the GPRS near Chisinau.
- Six pigging facilities; four shall be included within the GPRSs and another two will be separately built, occupying an area of ca. 100 m<sup>2</sup> each.

#### **Land allotment for permanent use**

The gas pipeline Ungheni-Chisinau will be statelily owned and managed by a statelily owned enterprise. In accordance with the Government Decree Nr. 1451, public land (both state and administrative-territorial unit ownership) shall be made available for use to the state owned enterprises and institutions for their business activities. In accordance with Article 15 of the Land Code, lands with low land class (a qualitative characteristic of land fertility expressed in points) are to be made available for construction of main pipelines and other non-agricultural facilities.

The Decree Nr. 1451 specifies in addition the procedure for preparation, submission and processing of application documents, and defines the involved authorities and timeframe of the process of allotting of both state owned land and land of administrative-territorial units (districts and municipalities).

If decision is made on public land allotment for state owned enterprises (Government Decree for state lands; decision of relevant local authorities for lands owned by administrative-territorial units), this will be done free of charge to the state enterprises.

#### **Land purchase for permanent use**

Land can be purchased based on market prices and on normative prices.

The normative prices for land purchase and respective procedures are defined by the Law Nr. 1308. In accordance with this law, the land purchase price is based on the land class, which is a qualitative characteristic of the soil fertility expressed in points and tariffs per point-hectare. For calculation of the normative price it is necessary to get cadastre characteristics of the affected land from:

- the territorial cadastre authority where the land is located and its ownership is registered – for purchase/sale of private lands;
- the Agency for Cadastre and Land Relationships – for publically owned land.

The land can also be purchased at market prices. To know the market price it is possible to approach estate/land evaluation companies which will evaluate the land market price (in accordance with the Government Decree

No. 958 of 04.08.2003 on temporary methodology of evaluation of estate/land).

Another option is to approach the IPOT. When it is a question of expropriation of land (for example for the block valve stations), the land price will be defined on the base of the fertility grades (evaluation made by IPOT) and the normative price of the land (MDL for 1 fertility grade per hectare, Law 1308 of 25.07.1997).

#### **Land expropriation**

Section V of the Law No. 1308 defines purposes and cases of expropriation of land for public needs (as defined by the Law No. 488 on expropriation for publicly important purposes).

In accordance with the Law Nr. 123 on Natural Gas, an authorized authority applying the procedure defined by the effective legislation can expropriate land plots for publicly important purposes, namely for construction, modernization, operation and maintenance of gas networks. After passing into public ownership of the state or an administrative-territorial unit, the expropriated land plot is transferred for use to operators of transmission or distribution networks free of charge.

In case of land expropriation, the compensation can be based on the market prices for land but cannot be less than the normative tariffs specified by Item II of the Annex to Law Nr. 1308, namely 1,248.02 MDL for one point-hectare.

Where the public administration authority and the landowner do not reach an agreement as to the market price of the land subject to forced alienation, the price shall be established by the judicial organ, based on an expertise report concluded by independent experts.

#### **4.1.7.2 Land allotment for temporary use**

The Land Code, Article 74, defines the procedures for temporary land withdrawal from agriculture use and forest lands. This temporary withdrawal is allowed for installation of gas pipelines (among other facilities) and is subject to the approval of local public management authorities and the consent of the land owners.

In accordance with the Law Nr. 123 on Natural Gas, a right to use the land plot shall be established by an agreement act with its owner which shall be valid for the entire periods of construction, modernization, operation and repair works.

The land owners are entitled to compensation of losses, as described below (Section 4.1.7.4). The organizations and enterprises which will use these lands temporarily (inclusively for construction of access roads for the construction period) shall ensure timely return to agriculture use and to forest land.

#### 4.1.7.3 Alteration of the land use category

The possibility for alteration of the land use category is defined by Article 71 of the Land Code. This alteration shall be made through a Governmental Decree by means of a proposal of the councils of the administrative-territorial units, based on applications of the land owners and in agreement with the environmental authorities. In some cases, the alteration of land use category can be decided by relevant local authorities, as specified in articles 8 and 9 of the Land Code.

A procedure for alteration of the land use category is defined by the Decree No. 1451, articles 32 to 36. The Government approves a decree on alteration of land use category within one month after the respective payment has been made to the state budget.

In accordance with article 99 of the Land Code and article 12 of the Law No. 1308, losses caused by withdrawal of lands from agriculture use and from forest lands shall be compensated. However, as specified by the Law No. 1308 and the Decree No. 1451, the losses caused by withdrawals from agriculture use for facilities of public importance, as defined by the Law Nr. 488, shall not be compensated. The list of objects and works which can be declared as required for public needs, as well as the respective procedure are specified in Section II “Public relevance and its declaration” of Law 488.

Taking into account the strategic importance of the gas pipeline Ungheni-Chisinau for ensuring energy security of the country, this object can be declared as of public relevance on the national level and thus exempted from the compensation payment in case of state owned land.

It shall be noted that land use change is applicable for the agriculture land plots allotted for construction of permanent aboveground facilities (for the Ungheni-Chisinau pipeline project these include the block valve stations, the Gas Pressure Regulation Stations and the pig launcher and receiver stations). It is not required to change the land use classification for agriculture land allotted temporarily for construction (Land Code, Article 74).

#### 4.1.7.4 Compensation for losses / damages

Article 97 of the Land Code stipulates that losses caused by temporary use of the land plots, abridgment of rights, or deterioration of land quality (including lost benefits) by other enterprises shall be compensated to land owners who suffered such losses. Disputes related to recovery of losses and their amounts shall be solved in courts or by arbitration.

##### **Ephemeral plants**

Ephemeral plants in agriculture can be various summer and winter cereals. Should temporary land withdrawal result in abridgment of rights of the land owners, restrict the seeding of summer/winter cereals, or result in a loss of

harvest, it shall be fully compensated. Ultimately it can be equal to the value of the lost harvest.

For each case, damages shall be evaluated separately and they are subject to agreement between the entity intending to use the land plot temporarily and the land owner. For the installation of the gas pipeline Ungheni-Chisinau it means that it will be necessary to negotiate with each land owner affected by the crossing of the pipeline through his/her land.

#### **Perennial plants**

In Moldova, agricultural perennial plants are mainly vineyards and fruit trees. If felling of trees and vineyards is required for construction of a project, their owners are entitled to compensation amounting to the plants' residual value, as well as for the lost profit for the remaining expected service life.

There are no common norms for evaluation of the residual value of vineyards/gardens if no service life and book value of these is available. In this case specialized evaluation companies shall be involved.

For each case, damages shall be evaluated separately and they are subject to agreement between the entity intending to use the land plot temporarily and the land owner. For installation of the gas pipeline Ungheni – Chisinau it means that it will be necessary to negotiate with each affected vineyard/garden owner.

#### **Other assets**

Theoretically for installation of underground pipelines it might be necessary to demolish some structures and buildings. But in the case of the gas pipeline Ungheni-Chisinau, the route options were selected in compliance with valid norms of SNiP 2.05.06-85 (table 4), meaning that the pipeline is distanced from the nearest residential buildings by not less than 150 m and from the nearest non residential buildings by not less than 50 m. This implies that no demolitions of buildings are expected.

#### **4.1.7.5 Forest trees**

The forestry sector in Moldova is regulated by laws, government regulations, and a provision in the Constitution that states “forests have a primary function to protect the environment, assuring its ecological equilibrium.” The Forest Code, together with specific provisions in the Administrative and Criminal Code and the Law on afforestation of degraded agricultural lands, regulates forestry planning, afforestation of degraded areas, and protected zones along rivers and water basins (The World Bank, 2007).

From the Forest Code Nr. 887-XIII (21.06.1996), two articles are important under the context of the Ungheni-Chisinau pipeline project:

- Article 6: all forests are public with exception of the cases when the forest is planted on the private land plot.
- Article 78, for construction of special facilities such as (...) gas pipelines it is allowed to withdraw forests from the forests fund. For this purpose a special Government decree is required.

In Moldova it is not common that forests are planted in private land. For the purpose of the ESIA, and considering the stage of planning of the project, it will be considered that all forests in the project area are public.

#### 4.1.7.6 Summary

In accordance with the valid legislation for construction of the state owned Ungheni-Chisinau gas pipeline:

- Public land (owned by the state or by the administrative-territorial units) can be made available for the construction of the project free of charge;
- Private land shall be bought;
- Subject to declaring this pipeline as of public relevance, no compensation for land use alteration needs to be paid in case of state owned land;
- Land allotment for temporary use (construction period) will require compensation of damages for possible losses of crop harvests and for fall of vineyards and fruit trees. In this case, negotiations with each relevant land/vineyard/fruit tree owner with possible involvement of specialized evaluation companies will be necessary;
- No other assets (buildings and structures) are expected to be affected by construction of this gas pipeline;
- No physical resettlement with related compensations is caused by construction or operation of the pipeline.

## 4.2 National Institutional Framework

The main governmental entities with interest in the environmental aspects of the project are as follows:

- The project's developer and owner, Ministry of Economy (MoE);
- The representative of the MoE for the implementation of the project, MEPIU (Moldova Energy Project Implementation Unit);
- The environmental licensing authority, Ministry of Environment (MoEn), including:
  - the Agency "Apele Moldovei";
  - the Ecological Inspections.

Each of these institutions is briefly described in this section.

#### 4.2.1 Ministry of Economy (MoE)

The Ministry of Economy (MoE) of Moldova is responsible for analyzing the social and economic position, structure and condition of the production potential of industry, agriculture, energy industry, transport, communication and road infrastructure, as well as of other branches of the economy. On this basis, it can develop concepts, strategies and programs for restructuring the economic sectors and for assuring the social and economic development of the country.

In the context of the Ungheni-Chisinau project, the MoE plays the role of the developer and the owner. In the ESIA process this means that the MoE is responsible for:

- Carrying out the ESIA process and producing the respective environmental documentation (Application regarding planned activities, Notification to the affected country in case of a transboundary ESIA process, EIA Program, EIA Documentation);
- Undertaking the process of public consultation (publishing of advertisements in newspapers, publishing of the EIA related documents on its website, organizing public debates, informing local and national authorities, collecting comments).

After the ESIA process is finished and the environmental permit is granted, the MoE will be responsible for enforcing the provisions of and respecting the conditions laid down in the permit.

#### 4.2.2 MEPIU

The MEPIU (Moldova Energy Project Implementation Unit) reports to the MoE and has the objective of ensuring the effective implementation of projects in the energy sector by administrating, monitoring and coordinating the works according to the requirements of international financial donor organizations.

In the context of the ESIA process for the Ungheni-Chisinau project, the MEPIU will support the MoE in the activities described in the previous section.

#### 4.2.3 Ministry of Environment (MoEn)

The Ministry of Environment of Moldova develops and promotes the state policy in the field of environmental protection and rational use of natural resources geared towards creating beneficial conditions for life, sustainable development of the country, international cooperation, and the approximation of national legislation to the European Union.

The MoEn is the responsible authority for application of the national EIA Law, for what it shall coordinate the process of environmental impact



assessment of the planned facilities and businesses with substantial effect on the environment. In more detail, Ministry of Environment has the following responsibilities within the ESIA process:

- Review the ESIA related documentation (Application regarding planned activities, EIA Program, EIA Documentation);
- Information disclosure activities: publish the ESIA related documentation on its website;
- Receive and consider the public comments on the documents produced;
- Liaise with the environmental authorities of neighbouring countries in case of a transboundary ESIA process;
- Make a decision on whether to issue or not an environmental permit for the project.

#### 4.2.3.1 Apele Moldovei

Apele Moldovei operates under the Ministry of Environment and is the administrative authority responsible for implementing the state policy in the field of water resources management, hydrology, water supply and sanitation. Other functions of the Agency are:

- participate in drafting laws, regulations and policy documents for the protection of settlements and agricultural land from flooding;
- develop and plan measures to protect water resources, along with their management;
- management of water supply systems and sanitation of settlements in the Republic of Moldova;
- develop river basins management plans;
- etc.

#### 4.2.3.2 State, Regional and District Ecological Inspections

The State Ecological Inspection (SEI) is the environmental enforcement agency responsible for the implementation of the legislation on environmental protection and use of natural resources. It has the following tasks:

- exercise control over compliance with the state environmental laws and regulations in matters of environmental protection and use of natural resources, including in the state border of the country;
- prevent the environmental impact of economic activities on the ecosystems' health;
- organize actions to combat illegal fishing, tree felling and poaching;
- carry laboratory tests on environmental features;
- working with local government bodies to develop and implement regional and local programs and plans of action for environmental protection;

- supervising the activities of economic operators on payment of bills for environmental pollution;
- issuing of environmental permits to utilities.

The SEI has a central office with divisions covering major environmental protection sectors and management functions, and four regional ecological agencies (TEAs). The SEI central office regulates large industrial installations and supervises TEAs, which carry out environmental assessment, permitting, monitoring and inspection activities with the help of 32 rayons (district units) (UN, 2005).

Different departments within SEI at both central and regional levels are entrusted with delivering permits and assuring compliance with permit conditions.

### **4.3 International Legal, Institutional and Policy Framework**

The European Bank for Reconstruction and Development (EBRD) and the European Investment Bank (EIB) are involved in the Ungheni-Chisinau project as international financing institutions. In addition, funds are granted from the EU Neighborhood Investment Facility (EU NIF). In the next sub-sections a description of these institutions, as well as the associated environmental and social standards can be found.

A brief summary of the EU EIA Directive is presented, given that the Moldovan EIA Law No. 86 has been based on it. The EU Habitats Directive and Birds Directive are in addition mentioned in this Section due to their relevance for the EIA, namely for the assessment of impacts on the biological environment. International conventions to which Moldova is a party are finally described.

#### **4.3.1 EU EIA Directive**

The EU EIA Directive 2011/92/EU of the European Parliament and of the Council on the assessment of the effects of certain public and private projects on the environment is the codification of the initial Directive of 1985 (85/337/EEC) and its three amendments. It applies to a wide range of defined public and private projects, which are defined in Annexes I and II. There is a mandatory EIA for all projects listed in Annex I. These projects are expected to have significant effects on the environment. For the projects listed in Annex II the national authorities have to decide whether an EIA is needed or not. This is done with the help of a so called “screening procedure”, which determines the effects of projects on the basis of thresholds/criteria or a by case by case examination. These criteria are listed in Annex III.

Specifically for pipeline projects, the annexes I and II read as follows:

- Mandatory EIA for pipelines with diameters exceeding 800 mm and lengths of at least 40 km for the transportation of gas, petroleum and chemical substances (Annex I, No. 16);
- Identification of the need for an EIA for Industrial installations for carrying gas (...) which are not included in Annex No. 1 (Annex II, No. 3, b).

The pipeline is planned to be more than 40 km long but to have a diameter of less than 800 mm. This means that the criterion of Annex I is not fulfilled. Thus, the identification of the need for an ESIA is required through screening. For the Ungheni-Chisinau pipeline project, the screening process was based on an “Application regarding planned activities” prepared by the project’s owner (MoE). After analyzing the Application, the MoEn took the decision to request a national EIA for the project (further details can be consulted in Section 2 of this ESIA).

The described procedure equals that of the Moldovan EIA Law (Section 4.1.1) and can be summarized as follows:

- the developer may request the competent authority to say what should be covered by the EIA information to be provided by the developer (scoping stage);
- the developer must provide information on the environmental impact (EIA report - Annex IV);
- the environmental authorities and the public (and affected Member States in case of transboundary impacts) must be informed and consulted;
- the competent authority decides, taken into consideration the results of consultations;
- the public is informed of the decision afterwards and can challenge the decision before the courts.

#### 4.3.2 EU Habitats Directive

The Habitats Directive or Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora has been adopted in 1992 as an EU response to the Bern Convention (please refer to Section 4.3.4.3 below).

The Directive aims to protect and cover habitats, design Special Areas of Conservation and identify species in need of strict protection. All in all the directive protects over 1.000 animals and plant species and over 200 so called "habitat types" (e.g. special types of forests, meadows, wetlands, etc.), which are of European importance.

The following annexes are directly applicable to the project:

- Annex II: animal and plant species of community interest whose conservation requires the designation of special areas of conservation;

- Annex IV: animal and plant species of community interest in need of strict protection.

Please refer to Section 7.2 for further details on protected species within the project area.

### 4.3.3 EU Birds Directive

The Birds Directive or Council Directive 2009/147/EC on the Conservation of Wild Birds aims to protect all European wild birds and the habitats for endangered as well as migratory species.

The following annexes are directly applicable to the project:

- Annex I: list of species which are subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution;
- Annex II:
  - Part A: list of species which may be hunted in the geographical sea and land area where the Directive applies;
  - Part B: list of species which may be hunted only in the Member States in respect of which they are indicated;
- Annex III:
  - Part A: list of species for which the following activities shall not be prohibited, provided that the birds have been legally killed, captured or acquired: sale, transport for sale, keeping for sale and the offering for sale of live or dead birds and of any readily recognisable parts or derivatives of such birds;
  - Part B: list of species for which the following activities may be allowed, making provision for certain restrictions, and provided that the birds have been legally killed, captured or acquired: sale, transport for sale, keeping for sale and the offering for sale of live or dead birds and of any readily recognisable parts or derivatives of such birds.

Please refer to Section 7.2 for further details on protected bird species within the project area.

### 4.3.4 International conventions

#### 4.3.4.1 Espoo Convention

The Convention on Environmental Impact Assessment in a Transboundary Context (informally called Espoo Convention) sets out the obligations of Parties to assess the environmental impact of certain activities at an early stage of planning. It also defines the commitment of the States to inform each other on all projects that are likely to have significant adverse environmental impact across boundaries.

Moldova ratified the Espoo Convention in 1994, and Romania in 2001. Because the pipeline route begins close to the border with Romania, there was the possibility that some transboundary impacts would be delivered to this country. In a first step, the MoEn considered that a transboundary EIA would have been potentially necessary. For this reason, and in respect of the Espoo Convention, the responsible authorities in Romania were informed about the project and asked whether the country wished to participate in the EIA process. The Romanian authorities determined not to participate, and as a consequence a national EIA process is undertaken for the Ungheni-Chisinau pipeline project.

#### 4.3.4.2 Bonn Convention

The Bonn Convention or Convention on Migratory Species (CMS) is an environmental treaty under the aegis of the United Nations Environment Programme. It is the only global convention specialized in the conservation of migratory species, their habitats and migration routes. The Convention was signed in 1979 and entered into force in 1983. Currently 121 parties have entered the convention. Moldova is a party to the Convention since 2001.

The Convention provides a global platform for the conservation and sustainable use of migratory animals and their habitats. It brings together the States through which migratory animals pass, the Range States, and lays the legal foundation for internationally coordinated conservation measures throughout a migratory range. Furthermore the CMS complements and co-operates with several other international organizations, NGOs and partners in the media as well as in the corporate sector.

Migratory species threatened with extinction are listed on Appendix I of the Convention. Migratory species that need or would significantly benefit from international co-operation are listed in Appendix II.

Some species covered by the CMS exist in the project area. Please refer to Section 7.2 for further details.

#### 4.3.4.3 Bern Convention

The Bern Convention or the Convention on the Conservation of European Wildlife and Natural Habitats is a binding international legal instrument in the field of covering natural heritage in Europe and some African countries. Moldova ratified the Bern Convention in 1994, the same year where it entered into force in the country.

The aims of the convention are to conserve wild flora and fauna and their natural habitats, especially those species and habitats whose conservation requires the co-operation of several States, and to promote such co-operation. Furthermore particular emphasis is given to endangered and vulnerable species, including endangered and vulnerable migratory species.

The appendices to the Bern Convention served as the model for the annexes to the Habitats Directive (please refer to Section 4.3.2 above). The appendices with relevance for the project are as follows:

- Appendix I: Strictly protected flora species;
- Appendix II: Strictly protected fauna species;
- Appendix III: Protected fauna species.

Please refer to Section 7.2 for further details on protected species within the project area.

#### 4.3.4.4 CITES

CITES or the Convention on International Trade in Endangered Species of Wild Fauna and Flora is an international agreement between governments. CITES was drafted as a result of a resolution adopted in 1963 at a meeting of members of IUCN (International Union for Conservation of Nature). The aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.

Currently 181 states have entered the convention. Moldova joined in 2001.

CITES works by subjecting international trade in specimens of selected species to certain controls. The species covered by CITES are listed in three Appendices, according to the degree of protection they need.

The project area contains some species mentioned in the CITES. Please refer to Section 7.2 for further details on protected species within the project area.

#### 4.3.5 EU Neighborhood Investment Facility (EU NIF)

The EU NIF brings together grant funding from the European Commission and the EU Member States and loans from European Public Finance Institutions. It supports infrastructure projects in the transport, energy, social and environment sectors, as well as private sector initiatives (in particular small and medium enterprises, SMEs) in the EU Neighborhood region.

To benefit from the NIF, a project has to be submitted by one of the authorised European Public Finance Institutions, such as the EIB, the EBRD, the Council of Europe Development Bank (CEB) or European bilateral development finance institutions from one of the Member States.

#### 4.3.6 European Bank for Reconstruction and Development (EBRD)

The European Bank for Reconstruction and Development (EBRD) was founded in 1991 to create a new post-Cold War era in central and eastern Europe, furthering progress towards 'market-oriented economies and the

promotion of private and entrepreneurial initiative'. It is currently active in more than 30 countries from central Europe to central Asia and the southern and eastern Mediterranean.

The EBRD has a political mandate in that it assists only those countries 'committed to and applying the principles of multi-party democracy [and] pluralism'. Safeguarding the environment and a commitment to sustainable energy are also central to the EBRD's activity.

#### 4.3.6.1 EBRD's Environmental and Social Policy (2008)

The EBRD's Environmental and Social Policy (ESP) is created in the context of recognition that financing sustainable development, in its social and environmental dimensions, must rank among the highest priorities of its activities. The present ESIA is elaborated under consideration of the ESP published in 2008. An update of the ESP has been undertaken in 2014, but the work on this ESIA has been contracted and initiated before the publication of this update.

In order to translate this objective into successful practical outcomes, the Bank has adopted a comprehensive set of specific Performance Requirements (PRs) that clients are expected to meet, covering key areas of environmental and social impacts and issues. PRs 1 through 8 and 10 include the requirements for direct investment operations; PR 2 and PR 9 are for financial intermediary operations.

##### **PR 1: Environmental and Social Appraisal and Management**

The EBRD considers it important that all companies receiving EBRD financing have an environmental and social management system that will allow them to comply with the ESP. This Performance Requirement outlines the client's responsibilities in the process of appraising, managing and monitoring environmental and social issues associated with projects proposed for financing.

##### **PR 2: Labour and Working Conditions**

The PR 2 states that good human resources management and a sound worker-management relationship based on respect for workers' rights, including freedom of association and right to collective bargaining are key ingredients to the sustainability of the enterprise.

##### **PR 3: Pollution Prevention and Abatement**

This Performance Requirement states that EBRD-financed projects must meet good international practice in pollution prevention and abatement, by, for instance, complying with relevant EU standards. This PR will be addressed and managed as part of the client's overall ESAP (Environmental and Social Action Plan) (see PR 1) and/or management system.

##### **PR 4: Community Health, Safety and Security**

Projects can increase the potential for community exposure to risks and impacts arising from temporary or permanent changes brought up by the

project. Communities may also be affected by impacts on their natural resources, exposure to diseases, and the use of security personnel. The requirements of the PR 4 intend to avoid or minimize these impacts and risks.

#### **PR 5: Land Acquisition, Involuntary Resettlement and Economic Displacement**

This PR applies to physical or economic displacement that can be full, partial, permanent, or temporary. The displacement can result from land rights for a project acquired from expropriation or negotiated resettlements, and from imposition of restrictions that result in people experiencing loss of access to physical assets or natural resources. The clients are encouraged to acquire land rights through negotiated settlements wherever possible.

The main objectives of PR 5 are to avoid or, at least minimize, involuntary resettlement, to provide compensation for loss of assets at replacement cost and to promote an appropriate disclosure of information, consultation, and the informed participation of those affected.

#### **PR 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources**

The EBRD recognizes the need for the protection and conservation of biodiversity in the context of projects in which it invests. PR 6 applies to projects in all types of habitats.

#### **PR 7: Indigenous Peoples**

This Performance Requirement recognizes that Indigenous Peoples (IP) may play a role in the process of transition towards open-market economies by promoting and managing activities and enterprises as partners in development. At the same time it is recognized by this PR that IP, as social groups with identities that are distinct from dominant groups in national societies, are often among the most marginalized and vulnerable segments of the population. Thus, special measures are required to ensure that indigenous men and women are not disadvantaged and that they are included in, and benefit from, Bank-supported projects as appropriate.

#### **PR 8: Cultural heritage**

This Performance Requirement aims to protect irreplaceable cultural heritage and to guide clients to avoid or mitigate adverse impacts on cultural heritage in the course of their business operations. It sets a framework for clients to protect cultural heritage through the avoidance, and where avoidance is not feasible, the reduction and mitigation of any potential adverse impacts by EBRD-financed activities, in an appropriate and proportionate manner.



### **PR 9: Financial intermediaries**

Financial Intermediaries (FIs) are a key instrument for the EBRD to promote sustainable financial markets and provide a vehicle to channel EBRD funding to the micro, small and medium-sized enterprise (SME) sector. Environmental and social risk management are part of the responsibilities delegated to the FIs. Nevertheless, the EBRD continues to have an interest in assessing and monitoring its performance in these fields.

### **PR 10: Information Disclosure and Stakeholder Engagement**

The EBRD considers that effective community engagement is central to the successful management of risks and impacts on communities affected by projects, as well as central to achieving enhanced community benefits. Stakeholder engagement is an ongoing process involving (i) the client's public disclosure of appropriate information so as to enable meaningful consultation with stakeholders, (ii) meaningful consultation with potentially affected parties, and (iii) a procedure or policy by which people can make comments or complaints.

## **4.3.7 European Investment Bank (EIB)**

The EIB is owned by and represents the interests of the European Union Member States and works closely with other EU institutions to implement EU policy. The bank provides finance and expertise for sound and sustainable investment projects which contribute to furthering EU policy objectives. More than 90% of its activity is focused on Europe but support is also provided to the EU's external and development policies.

All the projects financed by the EIB must not only be bankable but also comply with strict economic, technical, environmental and social standards.

### **4.3.7.1 EIB's Environmental and Social Practices and Standards Handbook (2013)**

EIB defined a set of 10 Environmental and Social Standards (ESS) which are described in the Environmental and Social Practices and Standards Handbook (2013). These are summarized as follows. A more detailed, but still summarized explanation is given in Annex 15.2.

#### **ESS 1: Assessment and Management of Environmental and Social Impacts and Risks**

This Standard applies to all operations likely to have significant and material environmental and social impacts and risks. Its overall objective is to outline the promoter's responsibilities in the process of assessing, managing and monitoring environmental and social impacts and risks associated with the operations specifically in what concerns: policy commitment, assessment, management, monitoring & evaluation, and stakeholder engagement.

### **ESS 2: Pollution Prevention and Abatement**

All EIB financed operations shall comply with the objectives of the ESS 2, namely: avoidance of any deterioration in the quality of human health or the environment, and any loss of biodiversity; support the EU aims of reducing GHG emissions and enhancing resource efficiency; integrated prevention of emissions to air, water and soil, waste management, energy efficiency and accident prevention.

### **ESS 3: EIB Standards on Biodiversity and Ecosystems**

This Standard aims at strengthening the implementation of the EIB's biodiversity objectives: maintenance of the integrity of areas of important biodiversity as well as the natural functions and processes of ecosystems and their resilience; internalization of biodiversity and ecosystems values into the cost benefit analysis and design of the project; consistency with EU environmental law; respect of and consistency with international conventions and agreements and conventions; ecosystems and land/seascape approach; ensuring the appropriate participation of local communities and IP in the decision-making process; implement adaptive management measures; efficient monitoring and reporting.

### **ESS 4: EIB Climate-related Standards**

These Standards require that EIB's financing as a whole is aligned with the EU climate policy. Climate change considerations should be taken into account at all stages of the project cycle, in particular during the pre-appraisal and appraisal stages. The following shall be carried out selectively: Adjusted Economic and Financial Rates of Return; Carbon footprint assessment; Climate change vulnerability assessment; Carbon credit potential assessment.

### **ESS 5: Cultural Heritage**

The EIB recognizes the significance of cultural heritage (tangible and intangible) as part of individual and collective identity, its central role in supporting the objectives of sustainable development and the promotion of cultural diversity. It promotes best practice principles of cultural heritage impact assessment and management. The objective of this Standard is to outline the promoter's responsibilities in terms of cultural heritage management.

### **ESS 6: Involuntary Resettlement**

Resettlement is a process to assist those displaced to replace their housing, assets, livelihoods, land, access to resources and services and to improve or at least restore their socioeconomic and cultural conditions to those levels existing prior to the project. If it is unavoidable, the promoter, with full involvement in the decision-making process of all stakeholders, and in particular the affected people, should adopt adequate steps to minimize and mitigate its adverse impacts from an early stage.

### **ESS 7: Rights and Interests of Vulnerable Groups**

Some individuals or groups may be less resilient to risks and adverse impacts than others. Within the context of EIB operations, individuals and/or groups who are at a higher risk of being unable to anticipate, cope with, resist and recover from project related risks and/or adverse impacts are considered vulnerable. Standard 7 sets out to avoid or minimize, or otherwise mitigate and remedy, potential harmful effects of EIB operations to vulnerable individuals and groups whilst seeking that these populations duly benefit from such operations.

### **ESS 8: Labour Standards**

Standard 8 aims at ensuring that the promoter respects the Core Labour standards of the International Labour Organization (ILO), as well as at promoting the relevant rights under the UN Guiding Principles on Business and Human Rights for the project to be financed. The standards set out herein seek to protect and support the fundamental rights of workers in EIB-financed operations. All operations financed by the EIB, whether located inside or outside the EU, are subject to these standards throughout their entire lifecycle.

### **ESS 9: Occupational and Public Health, Safety and Security**

The handbook lays down standards to protect and secure public and occupational health, safety and security and promote dignity of workers and citizens affected by EIB operations. EIB expects promoters to duly plan for, undertake, and monitor the adherence to these standards throughout the project life cycle while accounting also for first-tier suppliers and primary contractors.

### **ESS 10: Stakeholder Engagement**

Standard 10 outlines a systematic approach to stakeholder engagement that the promoter is expected to build and maintain by way of a constructive relationship with relevant stakeholders. It affirms the EIB's expectation that promoters uphold an open, transparent and accountable dialogue with all relevant stakeholders at the local level targeted by its EIB operations.

## **4.4 International environmental standards**

The following tables give an overview of the IFC (International Financing Corporation - World Bank Group) standards/limits for water emissions, ambient noise and ambient air concentrations that are applicable to the project. These limits are part of the IFC General EHS Guidelines (IFC, 2007) and the IFC EHS Guidelines for onshore oil and gas development (IFC, 2007b).

The standards/limits applicable within the European Union are in addition depicted (occupational noise: Directive 2003/49/EC; air quality: Directive 2008/50/EC).

**Table 4-1: IFC Hydrotesting water emission limits (IFC, 2007b)**

Parameter	mg/L, except pH
Total Hydrocarbon content	10
pH	6 -9
BOD	25
COD	125
TSS	35
Phenols	0.5
Sulfides	1
Heavy metals (total)	5
Chlorides	600 (average) 1200 (maximum)

**Table 4-2: IFC Ambient noise limits (IFC, 2007)**

Receptor	One Hour $L_{Aeq}$ (dBA)	
	Day 07h - 22h	Night 22h - 07h
Residential, institutional, educational	55	45
Industrial, commercial	70	70

Note: No ambient noise limits are defined in the european Noise Directive 2002/49/EC

**Table 4-3: IFC and EU Occupational noise limits**

Location/activity	Noise limits [dBA, unless otherwise indicated]			
	IFC, 2007		EU Directive 2003/10/EC	
	Equivalent Level $L_{Aeq, 8h}$	Maximum $L_{Amax, fast}$	$L_{EX, 8h} *$	$p_{peak}$ [Pa]
Heavy industry (no demand for oral communication)	85	110	87	200
Light industry (decreasing demand for oral communication)	50-65	110		
Open offices, control rooms, service counters or similar	45-50	-		

Individual offices (no disturbing noise)	40-45	-		
Classrooms, lecture halls	35-40	-		
Hospitals	30-35	40		

\*  $L_{EX}$  = Daily and Weekly Noise Exposure Level (for activities where daily noise exposure varies markedly from one working day to the next, Member States may use the weekly noise exposure level in place of the daily noise exposure level)

\*\*  $p_{peak}$  = Peak Sound Pressure (maximum value of the „C“ frequency weighted instantaneous noise pressure)

**Table 4-4: IFC and EU Air Quality Standards**

Pollutant	Averaging period	Air Quality Standards and <i>number of allowed exceedances</i> (when applicable) [ $\mu\text{g}/\text{m}^3$ ]	
		IFC, 2007	EU Directive 2008/50/EC
SO <sub>2</sub>	10 minutes	500	-
	1 hour	-	350 <i>24 times per year</i>
	24 hours	125 (IT1) 50 (IT2) 20 (GL)	125 <i>3 times per year</i>
NO <sub>2</sub>	1 hour	200	200 <i>18 times per year</i>
	1 year	40	40
PM <sub>10</sub>	24 hours	150 (IT1) 100 (IT2) 75 (IT3) 50 (GL)	50 <i>35 times per year</i>
	1 year	70 (IT1) 50 (IT2) 30 (IT3) 20 (GL)	40

IT = Interim target; IT are provided in recognition of the need for a staged approach to achieve the recommended guidelines / GL = Guideline

## 4.5 Gap Analysis

In order to identify differences between the national and the international framework requirements, a comparison of the EBRD Environmental and Social Policy and the EIB Environmental and Social Handbook with the EIA legislation of Moldova (Law No. 86 of May 29, 2014) has been undertaken. Because the national EIA law is a partial transposition of the EIA Directive (Directive 2011/92/EU of the European Parliament and

Council from December 13, 2011), the gap analysis includes this directive as well.

Table 4-5 summarizes the general ESIA procedure and ESIA documentation requirements, shows the differences and gaps between national and international requirements and describes the law/standard/requirement that has been applied for the ESIA for the project.

This analysis shows that several requirements of the financing institutions are not predicted in the national EIA law nor in the EIA Directive (elaboration of an ESMP, description of monitoring requirements, creation of a grievance mechanism, and consideration of pre-construction and decommissioning impacts in addition to those of construction and operation/maintenance). In these cases, the requirements of EIB and EBRD apply.

Although the national EIA Law was only partly transposed from the EU EIA Directive, no gaps between the two legal documents have been found in relation to the themes which apply for this project.

**Table 4-5: Gap analysis between the EIB and EBRD's requirements and the Moldovan legislation on EIA**

Theme	Law Nr. 86 on EIA, Moldova	EBRD Performance Requirements	EIB Environmental and Social Standards	EU EIA Directive	Gap	Applicable Law/Standard/Requirement
Necessity of ESIA / Categorization	<p>Mandatory EIA for pipelines with diameters exceeding 800 mm and lengths of at least 40 km for the transportation of gas, petroleum and chemical substances (Appendix 1, Nr. 14).</p> <p>Identification of the need for an EIA for oil and gas pipeline installations (...) (not included in Appendix no 1) (Appendix 2, Nr. 10, i)</p> <p>The gas pipeline is planned with a diameter of DN 600 → Appendix No. 2 project</p> <p>→ Identification of the need of an ESIA (Preliminary Assessment of the Planned Activities) required</p>	<p><u>Category A project:</u> Pipelines, terminals and associated facilities for the large-scale transport of gas, oil and chemicals.</p> <p>However: The categorisation of each project will depend on the nature and extent of any actual or potential adverse environmental or social impacts, as determined by the specifics of its design, operation, and location.</p> <p>→ Comprehensive ESIA likely to be required</p>	<p>A comprehensive environmental and/or social assessment is carried out for projects classified under Annex I of the EU EIA Directive, and/or where an ESIA is required by national legislation or for projects where likely significant impacts and risks on the environment, population, human health and well-being have been determined.</p> <p>EU EIA Directive 2011: Mandatory EIA for pipelines with diameters exceeding 800 mm and lengths of at least 40 km for the transportation of gas (Annex I); identification of the need for an EIA for oil and gas pipeline installations (...) (projects not included in Annex I) through a a) case-by-case examination or (b) thresholds or criteria set by the Member State (Annex III).</p> <p>→ Identification of the need for an ESIA required</p>	<p>Mandatory EIA for pipelines with diameters exceeding 800 mm and lengths of at least 40 km for the transportation of gas (Annex I); identification of the need for an EIA for oil and gas pipeline installations (...) (projects not included in Annex I) through a a) case-by-case examination or (b) thresholds or criteria set by the Member State (Annex III).</p> <p>→ Identification of the need for an ESIA required</p>	<p>EBRD requirements are stricter than national or EIB requirements (category A project).</p> <p>No gap between national, EIB and EU EIA Directive requirements</p>	<p>→ National and International requirements apply</p> <p>→ The identification of the need for an ESIA has been undertaken through a process of "Preliminary assessment of the planned activities"</p>
Scoping / Environmental Impact Assessment Program	<p>Scoping Process not explicitly mentioned</p> <p><u>However:</u> Preparation of an</p>	<p>The Client will undertake a scoping process with the identified stakeholders for Category A projects to ensure identification of all</p>	<p>In case of projects with significant expected impacts, the promoter shall engage in a scoping process with identified project affected persons</p>	<p>Scoping Process not explicitly mentioned</p>	<p>No gap.</p> <p>Scoping progress not explicitly mentioned in</p>	<p>→ National and International requirements apply</p>

Theme	Law Nr. 86 on EIA, Moldova	EBRD Performance Requirements	EIB Environmental and Social Standards	EU EIA Directive	Gap	Applicable Law/Standard/Requirement
(EIA Program)	<p>Environmental Impact Assessment Program (EIA Program) is mandatory for EIA (Art. 19).</p> <p>EIA Program shall set the EIA timetable, including consultations and public debates, list of public authorities the environmental impact assessment documentation shall be filed with, structure of the EIA Documentation, detailed list of the EIA works. Developer shall inform the public. Comments from the public/authorities to the Program shall be allowed.</p>	key issues to be investigated as part of the ESIA process, including development of a Stakeholder Engagement Plan.	(PAPs) and other stakeholders which will: ensure that all key issues to be studied in the ESIA are considered; facilitate the development a Stakeholder Engagement Plan (SEP).		national requirements, but these require preparation of EIA program with similar procedure and structure, inclusive with planning of stakeholder involvement.	<p>→ Preparation of EIA Program, including planning of stakeholder involvement.</p> <p>→ Full Stakeholder Engagement Plan presented as part of the ESIA Report</p>
Environmental and Social Management Plan (ESMP) / Environmental and Social Action Plan (ESAP)	Development of an ESMP /ESAP is not explicitly required.	<p>Environmental and Social Action Plan (ESAP): The client will develop and implement a programme of mitigation and performance improvement measures and actions that address the identified social and environmental issues, impacts and opportunities.</p> <p>The ESAP will document key environmental and social issues, the actions to be</p>	<p>Environmental and Social Management Plan (ESMP): The ESMP is a key tool to address the environmental or social impacts that have been identified and to ensure that projects comply with national laws, relevant international standards and frameworks and meet the EIB E&amp;S standards. Components of such plans may include a resettlement action plan, a livelihood restoration framework, a</p>	Development of an ESMP /ESAP is not explicitly mentioned.	National legislation requires for all projects with potential environmental impacts to have relevant mitigation measures in place. However it does not require a special and expansive ESMP /ESAP.	<p>→ International requirements apply</p> <p>→ An ESMP can be consulted in the present ESIA Report</p>



Theme	Law Nr. 86 on EIA, Moldova	EBRD Performance Requirements	EIB Environmental and Social Standards	EU EIA Directive	Gap	Applicable Law/Standard/Requirement
		taken to address them adequately, as well as any actions to maximise environmental or social benefits, the schedule and person/unit responsible for implementation and monitoring, and an estimate of the associated costs.	<p>biodiversity action plan, an indigenous peoples plan, a community development plan, a cultural heritage management plan and/or other specific plans and agreements.</p> <p>The ESMP should include:  Code of conduct, induction and environmental awareness training programmes;  Specified ESMP compliance auditing programme, including checklists; Specified programme for ESMP review and update; Document distribution and control methodology;  Schedule of incentives and penalties that will be applied;  Procedures to be followed for corrective actions, complaints and environmental incidents;  Specific plans to control a range of environmental issues by area of activity;  Resettlement plan (if required);  Compensation plan (if required); HIV/AIDS awareness and prevention plan; Health and safety awareness programme for the local community; Emergency procedures for a range of identified risks; and Public communication and disclosure plan.</p>			
Monitoring	Not explicitly	The client will establish	<u>Minimum content of ESIA:</u>	Not explicitly	National	→ International

Theme	Law Nr. 86 on EIA, Moldova	EBRD Performance Requirements	EIB Environmental and Social Standards	EU EIA Directive	Gap	Applicable Law/Standard/ Requirement
(as part of the ESMP / ESAP)	mentioned	<p>procedures to monitor and measure compliance with the environmental and social provisions of the legal agreements including effective implementation of the ESAP and the PRs. Monitoring is carried out by both the client and the Bank.</p> <p>For each project, the Bank will define with the client a monitoring programme in accordance with PR 1 or PR 9, specifying the appropriate monitoring tools.</p>	<p>Arrangements for monitoring and evaluation of the effectiveness of impact management measured as part of the overall promoter's environmental and social management plan and system, which shall include appropriate qualitative and quantitative indicators and draw on feedback from both internal and external sources, including affected stakeholders.</p>	mentioned	legislation does not require monitoring	<p>requirements apply</p> <p>→ An ESMP including monitoring procedures can be consulted in the present ESIA Report</p>
Public Consultation / Stakeholder Engagement	<p><u>Preliminary Assessment:</u> Result of preliminary assessment is posted on official web-page of authority developer shall have published in at least one national and one local newspaper (incl. deadline for comments) + official web-page and/or another address with</p> <p><u>EIA Program:</u> Submission of Draft EIA program to authority + copy of publication, announcement. Review of Draft EIA</p>	<p>PR 10 sets out requirements for information disclosure and stakeholder engagement. The requirements of national law and international commitments related to public consultation must always be met.</p> <p>The nature and frequency of stakeholder engagement will vary from project to project.</p> <p><u>Engagement during project preparation:</u> The client will: Identify the affected and interested parties and individuals which may be disproportionately affected; Identify how stakeholders will be affected and the extent of the</p>	<p>ESS 10 defines procedural requirements. Stakeholders' inputs will be documented and carefully considered throughout the project preparation and implementation phases.</p> <p><u>Minimum content of ESIA:</u> Comprehensive and context-specific stakeholder identification and analysis, including identification of individuals and communities actually and potentially impacted by the project, in particular vulnerable individuals or groups, as well as other relevant stakeholders. Description of the precise engagement and consultation activities undertaken with</p>	<p>Article 2 (4): Member states shall inform the public concerned if a specific project is exempt from the provisions laid down in the Directive (including the reasons).</p> <p>Article 4 (4): Public shall be informed about the determination whether an Annex II project is made subject to an assessment or not.</p> <p>Article 6: The public shall be informed, whether by public notices or by other appropriate means</p>	<p>Similar requirements for Public Consultation / Stakeholder Engagement. However, national requirements and the EU Directive focus on Public Consultation during the preparation of the ESIA and don't require monitoring (such as review the effectiveness of previous public consultation processes, reply ongoing feedback, etc.).</p>	<p>→ National and international requirements apply</p> <p>→ Full Stakeholder Engagement Plan for all project phases presented as part of the ESIA Report</p>

Theme	Law Nr. 86 on EIA, Moldova	EBRD Performance Requirements	EIB Environmental and Social Standards	EU EIA Directive	Gap	Applicable Law/Standard/ Requirement
	<p>program through authority + reply within 30 days.</p> <p><u>ESIA:</u> The developer is obliged to review public opinion by means of public consultations. Following the public debates and written comments received, the developer shall prepare a public participation report which shall be an integral part of the environmental impact assessment documentation. Public debates shall be conducted in the territory of the local public authority where the planned activity is to be implemented. Information of the public about the conduct of public debates (advert in the mass-media, official web-page of client and authority, posts at office and public places). The advert shall be put out no sooner than 10 days</p>	<p>potential impacts; Undertake a scoping process with the identified stakeholders for Category A projects, including development of a Stakeholder Engagement Plan; Disclose relevant information in the local language(s) and in a manner that is accessible and culturally appropriate, taking into account any vulnerable people; Undertake a process of meaningful consultation on a manner that is inclusive and culturally appropriate where workers and/or affected communities are, or may be, subject to significant risks or adverse impacts from a project.</p> <p><u>Engagement during project implementation and external reporting:</u> The client will provide ongoing information and receive feedback from identified stakeholders on: the effectiveness of the implementation of the mitigation measures; the affected communities' ongoing interests and concerns.</p>	<p>different groups of impacted individuals, communities and other relevant stakeholders as part of the impact assessment process, including details on information sharing, timing and formats of engagement, numbers and types of stakeholders consulted, feedback received and details on how feedback was taken into consideration in the identification and assessment of impacts, design of project alternatives, impact mitigation and monitoring (see Standard 10 for further guidance).</p> <p><u>ESS 10: Public Consultation</u> The promoter will undertake a process of meaningful consultation with the PAPs and other stakeholders. This shall be done at strategic decision-making points and before any impact is delivered. At minimum, the promoter will ensure that a regular, consistent and reliable platform of on-going dialogue and communication with stakeholders is maintained. The promoter will report to the stakeholders on the ultimate decisions. The promoter will review the effectiveness of previous public consultation processes.</p>	<p>such as electronic media where available, (...) early in the environmental decision-making procedures (...) and, at the latest, as soon as information can reasonably be provided about:</p> <p>(a) the request for development consent; (b) the fact that the project is subject to an EIA procedure (...) (c) details of the competent authorities responsible for taking the decision (...) (d) the nature of possible decisions or, where there is one, the draft decision; (e) an indication of the availability of the information gathered pursuant to Article 5; (f) an indication of the times and places at which, and the means by which, the relevant information will be made available; (g) details of the arrangements for public participation (...) Member States shall ensure that, within</p>	<p>For EBRD and EIB, Public Consultation / Stakeholder Engagement shall also be undertaken during project implementation.</p>	

Theme	Law Nr. 86 on EIA, Moldova	EBRD Performance Requirements	EIB Environmental and Social Standards	EU EIA Directive	Gap	Applicable Law/Standard/Requirement
	before launching the public debates. The findings of the public debates shall be entered in a minute (indication of the total number of participants, list of questions, objections and proposals put forth). The minute shall be drawn up within 3 days following the date of the conduct of the public debates and shall be signed by the chairperson of the meeting on the public debates. Answers on questions during the conduct of the public debates or within 15 days following the date of the conduct of the public debates.			reasonable timeframes, this information is made available to the public concerned. Detailed arrangements for informing the public and for consulting the public concerned shall be determined by the Member States.  Article 9: When a decision to grant or refuse development consent has been taken, the competent authority shall inform the public thereof (...)		
Grievance Mechanism	Not explicitly mentioned	<u>PR 10:</u> The client will establish a grievance mechanism, process, or procedure to receive and facilitate resolution of stakeholders' concerns and grievances about the client's environmental and social performance. It should address concerns promptly and effectively, using an understandable and	<u>Minimum content of ESIA:</u> Arrangements for grievance mechanisms and for steps that will be taken to ensure effective access to remedy for affected stakeholders.  <u>ESS 10: Grievance Mechanisms</u> The promoter will ensure that a grievance mechanism is introduced at project level at the very outset of project	Not explicitly mentioned	National ESIA legislation does not specify grievance mechanism.	→ International requirements apply  → Recommendations for grievance mechanisms can be consulted in the present ESIA Report

Theme	Law Nr. 86 on EIA, Moldova	EBRD Performance Requirements	EIB Environmental and Social Standards	EU EIA Directive	Gap	Applicable Law/Standard/Requirement
		transparent process that is culturally appropriate and readily accessible. It shall be provided at no cost. The client will inform the affected communities about the grievance process and publicly and regularly report on its implementation. Grievance mechanisms for workers (PR 2) will be separate from public grievance mechanisms.	design that is: legitimate and trusted; scaled to the risks and potential adverse impacts of the project; fair, transparent and inclusive. The promoter will introduce an effective feedback system to the mechanism, informing the affected communities about the project grievance process and its outcomes and reporting regularly to the public on its implementation.			
Technical Description of the Project	Description of the planned activities, including description of physical features of, and requirements to, land use during construction and operation stages.	Environmental and social issues and impacts will also be analysed for the relevant stages of the project cycle. These may include preconstruction, construction, operations, and decommissioning or closure and reinstatement.	The environmental and social impact assessment will take into account all relevant stages of the project cycle, including: preconstruction, construction and operations, decommissioning and reinstatement.	Annex IV: Description of the project, including description of: physical characteristics, land-use requirements during the construction and operational phase, main characteristics of the production process (nature and quantity of the materials used), estimation of type and quantity of expected residues and emissions from the operation	National legislation and EU Directive do not require to consider pre-construction and decommissioning.	<p>→ International requirements apply</p> <p>→ The assessment of impacts considers preconstruction, construction operation and decommissioning and reinstatement impacts and/or mitigation measures</p>

## 5. ESIA Methodology

The purpose of the ESIA process is to identify and quantify, wherever possible, significant direct or indirect environmental and social effects that the project may cause during pre-construction, construction, operation and decommissioning. The primary objective is to inform stakeholders timely of the purpose and potential impacts of the project.

An investigation area of ca. **1,000 meters** for both sides of the pipeline axis has been defined for the baseline assessment and evaluation of impacts of the project.

The present section presents the methodology undertaken by Fichtner to conduct the ESIA process for the Ungheni-Chisinau pipeline.

### 5.1 Methodology for data collection

As a first step of the ESIA process, the baseline environmental and social conditions within the project area have been identified. The data gathering commenced at the scoping stage and continued through the ESIA. The methodology used for the compilation of the data comprised:

- **Literature review:** Environmental and social data relevant to the proposed project in form of previous studies and reports was collected from open and governmental internet sources, reviewed and analyzed.
- **Interviews and meetings with authorities:** Some data, reports and information has been collected through direct contact with the national authorities. Fichtner developed in a first place a set of questionnaires regarding biological and socio-economic issues in English, Russian and Romanian. In a second step, these questionnaires have been delivered in hand to:
  - The regional environmental authorities of the affected districts (Environmental Inspections);
  - The Regional Councils of the affected districts;
  - The affected Primarias of the Chisinau district (in answer to comments received by the Chisinau Municipality to the draft EIA Program).

Another set of questionnaires has been developed by Fichtner's sub-consultant Tehno Consulting & Design (TCD) to collect socio-economic baseline data and prepare the social impact assessment. These questionnaires have been sent to the mayors in the project area, which have been then visited by TCD for collection of the questionnaires and discussion of the project's intentions and expectations.

- **Interviews with inhabitants of the project areas:** TCD conducted face-to-face interviews with 150 households in the project area based on a specifically developed questionnaire to collect information on land use

and ownership, and socio-economic conditions. The process of identification of the interview partners ensured that both males and females were interviewed. There was no selection based on group ages, but all interviewed persons were between 19 and 75 years old.

- **Collection of GIS data:** through direct contact with the MEPIU, Fichtner had access to some GIS data pertaining biological, physical and socio-economic characteristics of the project area. After handling by Fichtner's GIS team, these data have been used in the assessment of impacts and in the elaboration of maps.
- **Site visits:** several field visits were performed by the Consultant, partly accompanied by the Client, in order to get an impression of the project areas.

## 5.2 Methodology for classifying the impacts

There is no international consensus on an agreed approach for assessing the significance of impacts on the environment. For the assessment of the project impacts, an evaluation matrix based on different factors is used to allow a transparent and complete evaluation procedure. The method allows the identification and prediction of impacts according to:

- Scale: Local, Regional, National or International;
- Duration: Permanent or Temporary (Short, Medium or Long Term);
- Severity: Low, Medium or High;
- Certainty: Possible, Likely, Highly Likely or Definite;
- Direction: Positive (beneficial) or Negative (adverse);
- Direct or Indirect;
- Cumulative or not (an impact can be considered cumulative if the site is presently or will in the future (based on present knowledge) be affected by the same factor (e.g., water pollution)).

To classify the impact it is necessary in addition to identify the need for further investigations e.g. in form of a separate specialist study. These investigations may need to be undertaken by the Construction Contractor or Governmental Authorities during the detailed design phase or immediately before construction.

Considering the above listed factors, the significance of the impact can be finally determined:

- Significance: Nil or Negligible, Low, Medium, High or Very High.

In case mitigation or compensation measures are applicable, the residual impacts are then classified.

The assessment and classification of impacts for the Ungheni-Chisinau project is made in this ESIA for two options. This is because from the initial

set of three options, only one has been left out. The classification of the impacts will allow a comparative analysis of both options and a decision on which one shall be further studied. The Environmental and Social Management Plan is designed only for the preferred option.

### **5.3 Challenges and uncertainties**

The Ungenhi-Chisnau pipeline project is presently in its feasibility stage. As therefore, there is a possibility that the detailed design to be undertaken by the future contractor eventually introduces changes to the routes discussed in this ESIA. The reader shall, as therefore, interpret the routes analysed in this impact assessment as “corridors”. These corridors are relatively flexible - in fact, there are recommendations along this ESIA to deviate the analysed routes at some points to mitigate impacts. The detailed recommendations can be consulted in Section 8 of this ESIA.

In addition, this ESIA has been elaborated in a relatively early stage of the planning, when several technical details have not yet been fixed. This may also imply future changes to some of the dispositions of this report.

The present ESIA has the particularity of implying the comparative assessment of impacts of two different routing corridors, which is an abnormal situation in an ESIA process. However, the scoping phase showed that, without a deeper assessment, it would not be possible to determine which from the two options would be more feasible from an environmental and social point of view.

Another challenge of the ESIA process for this project is the fact that the national EIA Law has been only recently in force in the country, and the responsible authorities and the Project Owner have no experience in applying its dispositions. In addition, the ESIA has been developed in conformity with the standards of the international financing institutions EIB and EBRD, as well as the dispositions of the EU EIA Directive, which differ in some points from the national EIA Law (a gap analysis is available in Section 4.5). Due to this, the ESIA process has gone beyond the dispositions of the national law in some areas (e.g., elaboration of an ESMP, public consultation timelines, definition of grievance mechanisms). This seemed to have raised even more difficulties for the authorities and the Project Owner.

The MEPIU is the organism responsible for the implementation of the project on behalf of the owner, the Ministry of Economy. However, no environmental specialist has been nominated to take part of the unit.

Fichtner faced some difficulties in gathering baseline data for the project area. Interviews with local and national authorities have been undertaken, but specific and usefull information about the project site has not been obtained from this process.

IPOT possesses GIS data of the site related to some features which are important for the ESIA: soil erosion, buildings, gardens, and others. These



data have gently been made available to Fichtner. However, some features represented in the data files do not correspond to the reality shown by the satellite imagery which has been used in the study. Due to this, Fichtner manually undertook an update of the GIS data made available by IPOT.

A good official GIS database about the country is available on-line (URL 5), but the access to workable data has not been fully granted. This implied difficulties in representing the baseline features of the project area, as well as the environmental/social impacts in the maps available in the annexes to this report.

The difficulty in obtaining baseline information partly hindered the process of quantification of impacts.

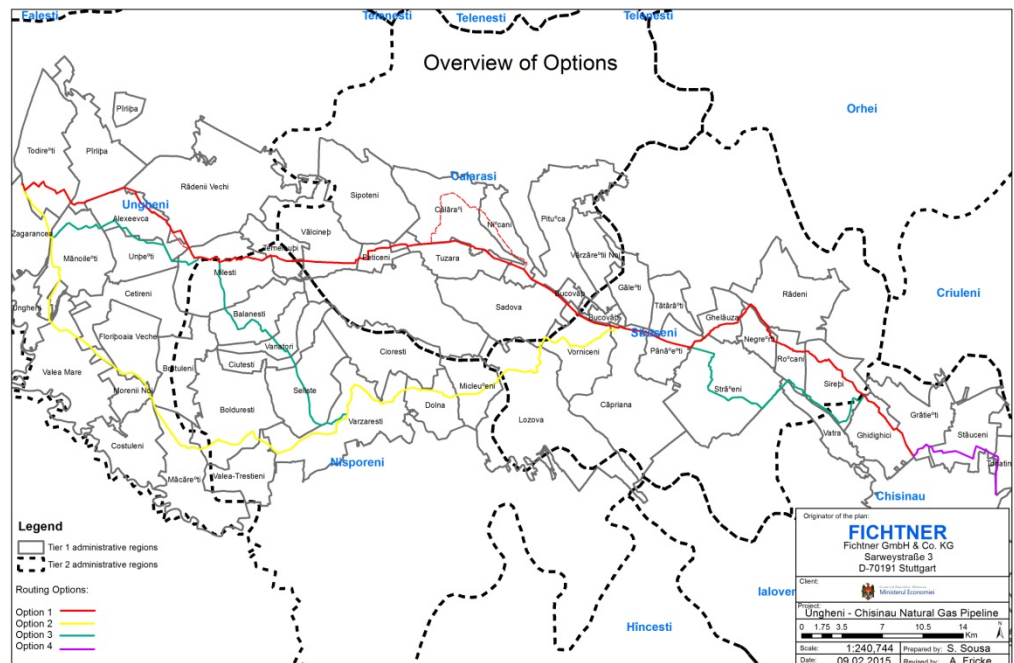
In relation to the socio-economic baseline survey (Section 7.3), it has been noted a reluctance from many interviewed persons to answer some questions, especially those related to wages and household expenditures. Overall, it is common in Moldova that people are not fully aware of the purpose of these type of interviews and demonstrate as therefore some anxiety during the process.

Despite the above described challenges and uncertainties, the collective work undertaken between Fichtner, the MoE, the consulted authorities and the IFIs allows to present an ESIA which provides a clear picture of the expected impacts of the project, as well as of the mitigation and compensation measures to be applied in the following project stages.

## 6. Consideration of Alternatives

A Basic Routing Study has been performed by the IPOT State Planning Institute for Land Management (Fichtner and IPOT, 2014). Three routing options, which include some sub options, have been developed with a final common section in the last 13 km. A detailed description is given in the mentioned study developed by the IPOT Institute, which also includes a set of maps. Figure 6-1 shows an overview of the initially considered routing options, which are named as follows:

- Option 1, including Option 1b - red line
- Option 2- yellow line
- Option 3 - green line
- Common section (initially named Option 4) - purple line



**Figure 6-1: Overview of the initially considered routing options**

The start point for routings 1 to 3 is close to Todiresti (coordinates  $x = 240345.21 / y = 154549.02$ ), in the Ungheni district. The end point for routings 1 to 3 is close to Chisinau (coordinates  $x = 215399.14 / y = 231355.58$ ). The location is in the vicinity of the M21 "Balcani" national road. The end point has been discussed on site. Based on the results, the end point shall be adjusted in the next project phase.

The common section (initially named Option 4) connects the end point of options 1 to 3 with the existing GPRS #1.

## **6.1 Description of the initial options**

### **6.1.1 Options 1 and 1b**

Route Option 1 starts in the east and passes to north of Alexeevca, Milesti and Peticeni. Afterwards, the route crosses the city of Calarasi. A sub option has been planned which bypasses the city of Calarasi (Option 1 b). Afterwards, the routing turns into a more south easterly direction and passes to south of Bucovat. In the following, it passes to north east of Negresti, Sirethi and Ghidighici.

The total length of the route is 98 km. If Option 1b is considered, the total length is 104 km. It crosses 28 administrative units, intersects the Chisinau - Ungheni railway twice and crosses 15 national and local roads. In addition the route crosses the existing Balti – Ungheni Pipeline, 6 rivers and one lake.

### **6.1.2 Option 2**

Route Option 2 runs in parallel to the existing Chisinau-Ungheni Pipeline, where possible. The route starts in south easterly direction and passes Ungheni and Morenii Noi before turning left close to Basceni.

In the following the routing runs east and passes Varzaresti, Dolna and Vorniceni. Close to Bucovat the route Option 2 converges with Option 1 and takes the same route.

The total length of the route is 117 km. It crosses 25 administrative units, intersects the Chisinau - Ungheni railway twice and crosses 22 national and local roads. In addition the route crosses 7 rivers.

### **6.1.3 Option 3**

Considering that Ungheni, Nisporeni and Straseni districts are located in the “Codru” area with a very complicated and fragmented relief, with many landslides, forest and perennial plantings, the proposed routing options coincide on some sections. The route Option 3 partly runs in parallel with Option 1 and partly with Option 2.

Option 3 starts on the same route as Option 2, but turns left after some kilometers and heads in easterly direction towards Alexeevca, where the route converges into the route Option 1. After a few kilometers in parallel to Option 1, it turns right and runs south east, passing Milesti, Balanesti and Seliste. It converges with Option 2 close to Varzaresti. From here, Option 3 runs in parallel with Option 1 and Option 2.

Close to Straseni Option 3 leaves the routes of Option 1 and 2 and passes to south of Straseni. Afterwards, it runs parallel to Lake Ghidighici to finally converge on route Option 1 close to Ghidighici.

The total length of the route is 118 km. This routing option of the pipeline passes 23 administrative units, intersects the Chisinau - Ungheni railway three times and crosses 21 national and local roads. In addition the route crosses 7 rivers and 1 lake.

#### **6.1.4 Common section**

The common section of the three options connects the end point of Option 1 to 3 with the existing Pressure Reduction Station No.1. Given the complex urban conditions, an alternative route on this segment does not exist.

The route passes to north of Chisinau, turns right after some kilometers and runs north towards the GPRS #1.

This section passes across the territories of Gratiesti, Stauceni and Tohatin administrative units and Chisinau municipality. Its total length is 12.91 km.

### **6.2 Selection of the most suitable options**

As part of the pre-feasibility study for the Ungheni-Chisnau Pipeline, an initial scoping procedure has been undertaken and the results are shown in the Inception Scoping Report (Fichtner, 2015).

The Inception Scoping Report had the main objective of presenting a comparison of the three routing alternatives from an environmental and social point of view. With this objective, a comparative analysis of the baseline characteristics of the three project areas with potential to be impacted by the project has been undertaken by means of satellite imagery, the results of a technical survey and a GIS software.

The baseline features of the project area which can potentially be impacted by the project's pre-construction, construction, operation and decommissioning considered in the Inception Scoping Report were as follows:

- Private possessions:
  - Orchards;
  - Arable lands;
  - Pastures;
  - Vineyards;
  - Construction and courtyards;
  - Gardens.
- Environmentally sensitive areas:
  - Aquatic basins;
  - Forest;
  - Stream, rivers and rivulets;
  - Areas prone to landslide;
  - Ravines.

- No-crossing features:
  - Cemeteries;
  - Buildings.
- Public Infrastructure:
  - Channels;
  - Railways.

The basis for the comparison lied on the capacity of the route under study to avoid, or at least, minimize the impacts on the environmental and social features of the areas. This implies that the features as above described should be avoided to the maximum extent which is technically and economically possible.

The GIS software allowed a calculation of the area or length of each of the features that could be impacted by the pre-construction, construction and the operation of the pipeline. For this calculation, it was taken into consideration that the pre-construction and construction activities imply a strip of 16 meters of width where opening of trenches and deposition of some materials is made and construction vehicles circulate. In addition, a safety strip of 50 meters of width as mandated by the Moldavian law was considered for the operational phase of the pipeline. On this strip, no building can be constructed and no trees or vines can be planted.

The classification of each route option was undertaken as a relative assessment and was based on the comparison of the different route options between each other. The following scale was used for the assessment:

- (-) whenever the feature is subject to a permanent impact; and/or the impact cannot be solved by re-routing; and/or the option shows clear disadvantages for this feature in relation to other options;
- (0) whenever the feature is subject to a temporary impact; and/or the impact can be solved by re-routing; and/or the option shows some advantages/disadvantages for this feature in relation to other options;
- (+) whenever the option shows clear advantages for this feature in relation to other options.

All features were weighted equally, except for Orchards, Vineyards, Forest and the no-crossing features Cemeteries and Buildings, which are classified as „significant for the decision“ - (e).

### 6.2.1 Results

Using a GIS software, Fichtner calculated the area or length of the affected features for both the construction and the safety strips (the detailed results can be consulted in the Inception Scoping Report). Based on this, it was possible to comparatively classify each of the options based on the scale described previously (Table 6-1).

**Table 6-1: Classification of the route options based on the extension and nature of the impacted features**


Features	Option 1	Option 2	Option 3	Justification
Private possessions				
Orchards (e)	-	-	-	All options imply permanent impacts of similar intensity
Arable Lands	0	0	0	All options imply temporary impacts of similar intensity
Pastures	0	0	0	All options imply temporary impacts of similar intensity
Vineyards (e)	-	-	-	All options imply permanent impacts of similar intensity
Construction and Courtyards	0	0	0	All options imply temporary impacts of similar intensity
Gardens	+	0	-	All options imply temporary impacts, but Option 1 implies significantly less impacts than the others and Option 3 implies significantly more
Environmentally sensitive areas				
Aquatic basins	+	0	-	All options imply temporary impacts, but Option 1 implies significantly less impacts than the others and Option 3 implies significantly more
Forest (e)	0	0	-	All options imply permanent impacts, but Option 3 implies significantly more impacts than the others
Streams, rivers and rivulets	-	0	0	All options imply temporary impacts, but Option 1 implies significantly more impacts than the others
Landslides	+	0	-	All options imply temporary impacts, but Option 1 implies significantly less impacts than the others and Option 3 implies significantly more
Ravines	0	0	0	All options imply temporary impacts of similar intensity
No-crossing features				
Cemeteries (e)	+	+	0	Options 1 and 2 do not imply any impact and Option 3 implies some more impacts than the others
Buildings (e)	0	+	+	Options 2 and 3 do not imply any impact and Option 1 implies some more impacts than the others
Public Infrastructure				
Channels	0	0	0	All options imply temporary impacts of similar intensity
Railways	0	0	0	All options imply temporary impacts of similar intensity


Note: (e) = significant for the decision

Table 6-2 presents the overall classification based on the accounting of the number of occurrences of each of the scale items (+, 0, -) for each option as presented on Table 6-1.

**Table 6-2: Overall classification of the route options for all features and for the significant features**

OVERALL CLASSIFICATION				
Number of occurrences of each of the scale items				
Features	Scale	Option 1	Option 2	Option 3
All Features	(-)	2	2	6
	(0)	8	10	8
	(+)	4	2	1
(e) Features	(-)	2	2	3
	(0)	2	1	1
	(+)	1	2	1

 The option registered the highest number of occurrences of the (-) item

 The option registered the highest number of occurrences of the (+) or the (0) items

The results show that Option 3 is the least feasible when considering environmental and social aspects. This option implies in general impacts of greater intensity than Options 1 and 2. For example, the areas of forest, aquatic basins and gardens to be affected by the security and construction strips are significantly higher. Also, this is the only option which implies the direct crossing of a cemetery.

Both Options 1 and 2 showed advantages in relation to Option 3 and it was difficult at the pre-feasibility stage to determine which from these two was more feasible from an environmental and social point of view. If, on the one hand, Option 1 implies crossing significantly less gardens, on the other hand it implies disturbing a significantly higher area of streams, rivers and rivulets. Option 2 implies the crossing of more aquatic basins than Option 1, but does not imply the crossing of any buildings, unlike Option 1. Option 1 is the only which initially included buildings inside the safety strip (130 m<sup>2</sup>). Because this was not a significant area, there was the possibility to deviate the pipeline routing (Section 6.3).

Because Option 1 and Option 2 present comparable advantages and disadvantages, they are both considered for further assessment.

### 6.3 Refinement of options

The results of the Basic Routing Study and the Pre-Feasibility Study pointed the need to undertake modifications to the line routing. Measures such as keeping distance to lakes, rivers and villages, shortening the pipe's length, or avoiding eroded areas have been considered for the refinement of the options. Also taken into account was the principle of placing the pipeline as much as possible on arable lands and pastures, and as little as possible on lands occupied by perennial plantations and forest. This was motivated by the fact that it is more expensive to compensate for damages and missed income related to perennial plantations and deforestation. Besides, the forest areas have an ecological value which does not exist in pasture and agricultural lands.

The suggested alterations to the route Options 1 and 2, as well as to the common section are described in **Table 6-3** and some are shown from **Figure 6-2** to **Figure 6-6**.

**Table 6-3: Description of the modifications made to the route**

Turning points	Modifications
<b>OPTION 1</b>	
7 - 9	This segment was modified in order to bypass a landslide area and to avoid turn with an angle of less than 90°.
48 - 52	This segment was modified in order to account for the topology of terrain and land ownership issues, as well as to consider the crossing to be perpendicular to the existing pipeline.
111 - 125	This segment was modified due to the intersection of 2 steep slopes in the previous version. In order to bypass these slopes, the route was shifted westward at a distance of about 500 m toward the previous version, and will be located along the boundaries of Peticeni administrative unit, Calarasi rayon at a reasonable distance.
145 - 149	The segment has been modified in order to distance from industrial buildings, the Bic River and the damaged station of the industrial water treatment plant (Figure 6-2).
152 - 156	The segment has been changed in order to keep distance from the Bic River.
171 - 173	The segment has been changed in order to keep distance from the Bic River.
186 - 188	Modified segment because previously the route was located too close to the existing lake (Figure 6-3).
196 - 198	Modified section because the segment between points 197 and 198 was located on a very steep slope, which would complicate the pipeline's construction.
201 - 206	The section was re-routed in order to keep distance from an existing waste dump and to avoid the passage through a very young orchard (2 years).
220 - 227	The section was re-routed in order to avoid the intersection with a closed chemicals basin and with a forest in SFF (State Forest Fund) property planted on a very steep slope.



Turning points	Modifications
224 - 250	This section has been modified to avoid crossing over a sand pit with a depth of 8-10 m.
256 - 258	This section was modified to bypass an existing lake
293 - 303	<p>The section has been re-routed because the lands between points 293 and 301 were close to a planned residential neighborhood according to the general urban plan of Ghidighici village:</p> <p>In the amended version, after point 292 the pipeline turns to the northeast crossing an arable unprocessed field, further passing on the territory of commune Gratiesti, where it will be placed on arable land, parallel to field roads and existing forest strips at a distance of 400-700 m from the previous version. Then it will return to point 303 of the previous version.</p>
---	Considering that the field road near the place provided for location of the pig launcher and receiver station Vatra (northeast of the pig platform Ghidighici) is included in the general urban plan as an access road to the residential neighborhood, the station was shifted to a distance of about 120 m southward from the previous place, but on the same field.
---	Other smaller modifications on this option were carried out in order to shorten the pipeline, reduce the bends, avoid erosion prone areas, etc.
<b>OPTION 1b</b>	
15 - 20	The segment was modified because the pipeline crosses land with a very steep slope, where soils are very sandy. This implied a risk of uncovering the pipeline (Figure 6-4).
<b>OPTION 2</b>	
182 - 192	This segment was modified because previously the route was at a distance of 100 m from the edge of the Sendreni village, in the Nisporeni rayon (Figure 6-5).
<b>COMMON SECTION</b>	
---	The route close to the GPRS and pig launcher station in Vatra has been changed due to the shift of these installations in the northeast direction (to Ghidighici).
25 - 27, 33 - 35	These sections were modified in order to avoid sharp or 90° bends and to reduce the length of the pipeline.
38 - 43	This section was modified in order to keep distance from the steep slope (about 25m). Land used for landfills, gardens and soil deposition has also been avoided with the modifications.
46 - 48	This segment has been changed to avoid crossing a very deep hollow. In its new version, the route will bypass this ravine (Figure 6-6).
---	Other smaller modifications on this option were carried out in order to shorten the pipeline, reduce the bends, avoid erosion prone areas, etc.

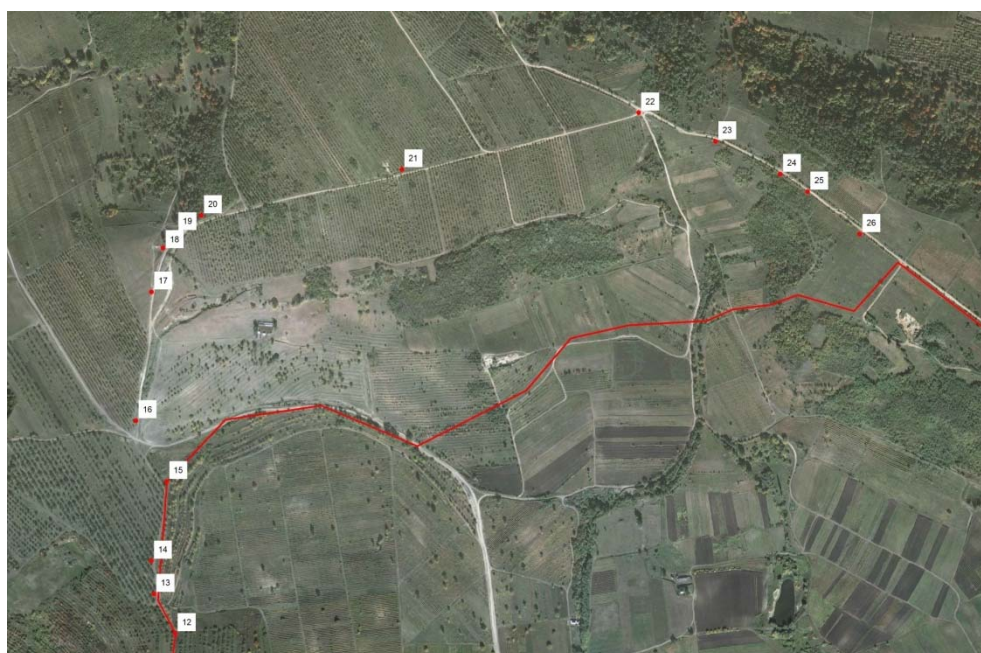
Turning points	Modifications
1-8	A new segment within the common section has been created starting from the GPRS Ghidighici, intersecting afterwards the national road M21 (Chisinau-Dubasari-Poltava) and continuing parallel to the road on a distance of 20-25 m until point 5. Because in future a neighborhood will be built, after this point the route shall cross once more the road M21. It will continue afterwards on state owned arable lands managed by the Agrarian State University of Moldova. The total length of the new segment will be 2.69 km and will be located on the territory of two administrative units.



**Figure 6-2:** Optimization of the route Option 1 between points 145 and 149 to avoid proximity with industrial buildings, the Bîc river and the damaged water treatment plant (the non-connected red dots correspond to the previous line routing)

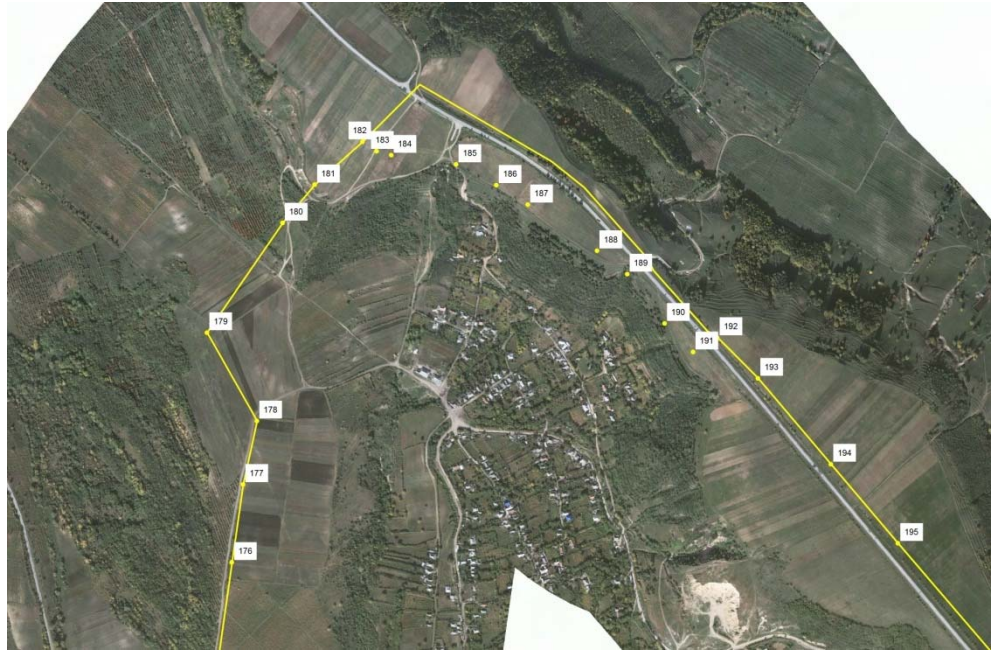


**Figure 6-3:** Optimization of the route Option 1 between points 186 and 188 to avoid proximity to a lake (the non-connected red dot corresponds to the previous line routing)



**Figure 6-4:** Optimization of the route Option 1b between points 15 and 20 to avoid crossing an erosion prone area (the non-connected red dots correspond to the previous line routing)





**Figure 6-5:** Optimization of the route Option 2 between points 182 and 192 to avoid proximity to the village of Sendreni in the Nisporeni rayon (the non-connected yellow dots correspond to the previous line routing)



**Figure 6-6:** Optimization of the common section between points 46 and 48 to avoid passing through a ravine (the non-connected purple dot corresponds to the previous line routing)

A comparative overview of the main characteristics of original and the refined route options can be consulted in Table 6-4.

**Table 6-4:** Overview of the main characteristics of the original and the optimized route options

Routing	Original routing options	Optimized routing options
---------	--------------------------	---------------------------

Options	Length [km]	Adm. Units crossed	Turning points	Length [km]	Adm. Units crossed	Turning points
Option 1	98.10	24	303	62.22	17	186
Option 1b	104.41	24	340	68.86	17	221
Option 2	117.0	28	443	82.12	19	304
Common section	12.91	5	53	51.09 *	13	185

\* Because route option number 3 has been discarded, the common section between options 1 and 2 became longer

Figure 6-7 shows an overview of the refined route Options 1 (red), 1b (red) and 2 (yellow), and the common section (purple).

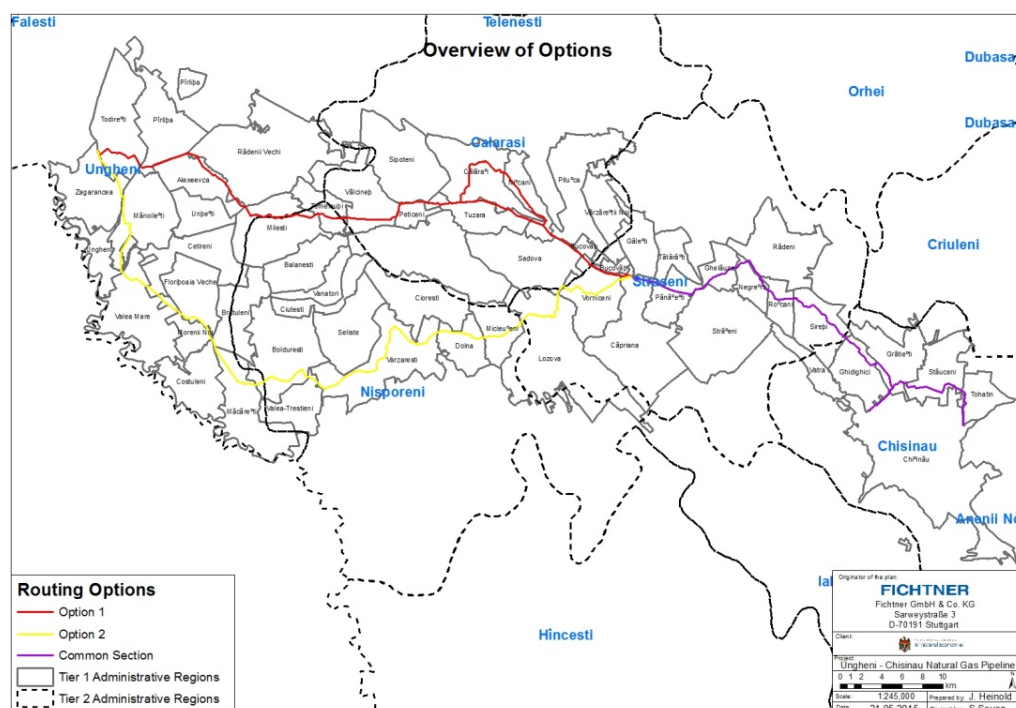


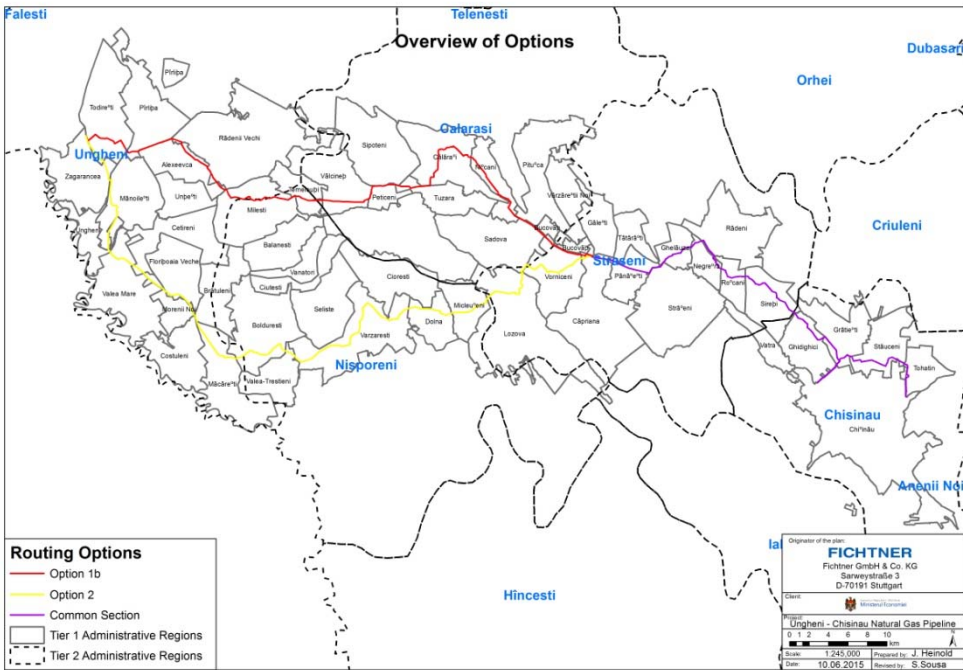
Figure 6-7: Overview of the refined routing options

## 6.4 Further refinement of Option 1

When comparing Options 1 and 1b, it is clear that Option 1 implies a less important impact on private land than Option 1b, because it is shorter. It implies as well less costs with compensations and with material for the pipeline. However, route Option 1 passes close to a petrol station (ca. 82 m), which, according to the applicable Moldovan technical rules, is not allowed.

Due to these reason, it is decided to abandon Option 1 and further study Option 1b and Option 2 in the feasibility stage and in the present ESIA.

An overview of the finally considered options can be consulted in Figure 6-8.



**Figure 6-8: Overview of the finally considered routing options**

## 7. Environmental and Social Baseline

This Section provides a description of the environmental and social baseline conditions in the project area, i.e., the existing physical, biological and socio-economic conditions before the project's implementation. The determination of the baseline status of the project area is essential to assess the significance of the negative and positive impacts to be eventually delivered by the project's construction and operation.

The information presented in this section is based on secondary literature, interviews with authorities and inhabitants of the project area, quantitative and qualitative analysis of GIS data, and site visits (Section 5.1).

The following aspects are considered in this section:

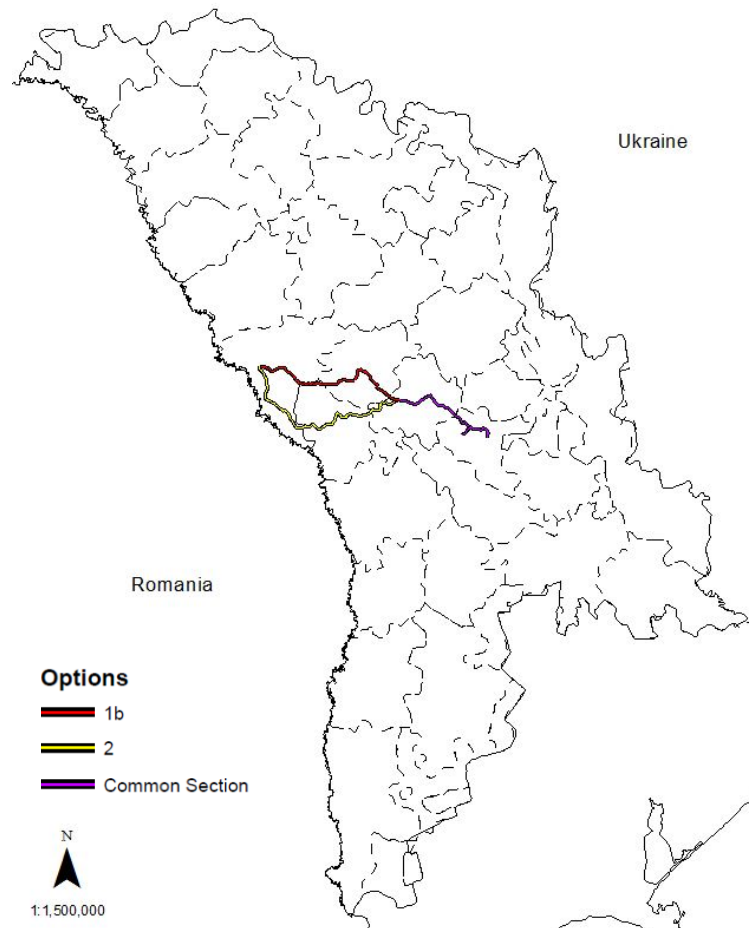
- **Physical environment** (incl. Topography and Geology, Soils, Climate, Air Quality and Noise, Hydrology, Hydrogeology, Landscape)
- **Biological environment** (incl. Flora and Fauna, IUCN Red List Species, Protected Areas, the National Ecological Network, Biodiversity)
- **Human Environment** (incl. Administrative Boundaries and Local Governance, General Economic Conditions, District Profiles, Ethnic Composition, Education level, Agriculture, Income, Expenditures, Water, Sanitation, Access to Electricity, Tourism, Significant cultural, religious and historical Sites)

The following maps can be found in Annex 15.7 and serve as a support to this Section:

- Map No. 1: Major Biodiversity Values - National Ecological Network of the Republic of Moldova
- Map No. 2: Target Species - National Ecological Network of the Republic of Moldova
- Map No. 3: Ecological Corridors - National Ecological Network of the Republic of Moldova
- Map No. 4: Eroded areas and landslides in the project area and expected areas of impact (erosion enhancement)
- Map No. 5: Agricultural areas in the project area, and expected areas of impact (loss of productivity)
- Map No. 6: Surface water in the project area, and expected areas of impact (crossing, contamination and over usage)
- Map No. 7: Residential areas in the project area, and expected areas of impact (air and noise emissions)
- Map No. 8: Protected and other green areas in the project area, and expected areas of impact (landscape and biological environment)

## 7.1 Physical environment

The Republic of Moldova, with about 34.000 km<sup>2</sup>, is one of the smallest European Countries. It is located in the southeastern part of Europe, neighbored by Ukraine and Romania. The project area is located in the center of Moldova (Figure 7-1).



**Figure 7-1: Location of the project area within Moldova**

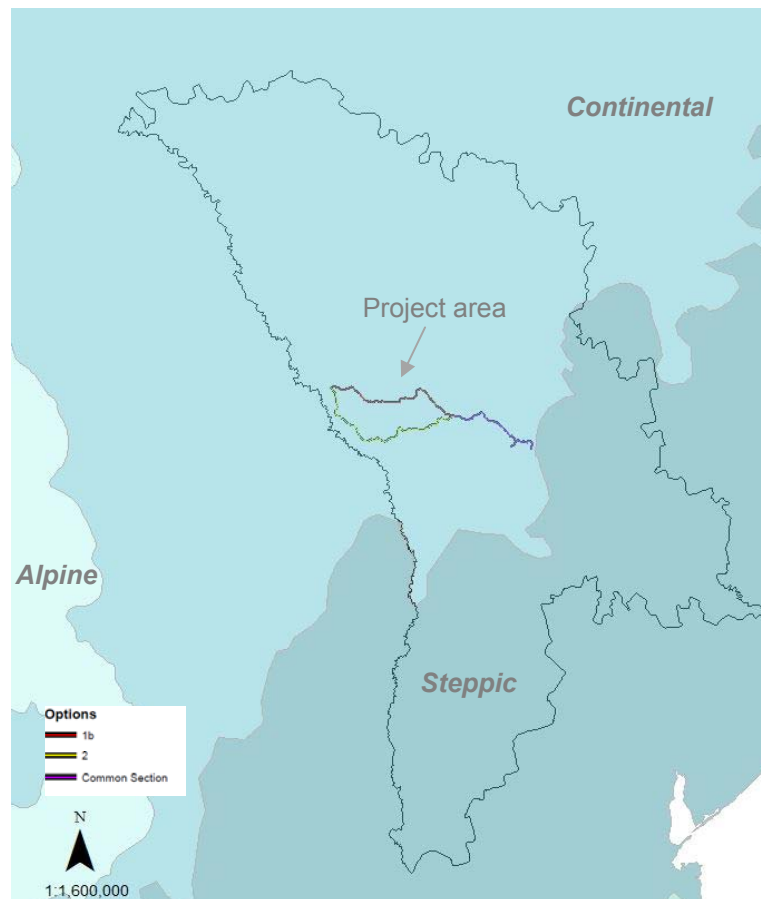
The project crosses five districts: Option 1b crosses the districts of Ungheni, Nisporeni, Calarasi and Straseni; Option 2 crosses the districts of Ungheni, Nisporeni and Straseni; the common section crosses the districts of Straseni and Chisinau (Figure 7-2).



**Figure 7-2: Districts crossed by the project**



The territory of the country is situated at the interference of three bio-geographical zones, as defined by the European Commission and the Council of Europe: the Alpine zone to the west of Moldova, the Steppic region to the south and the Continental region which includes the project area.



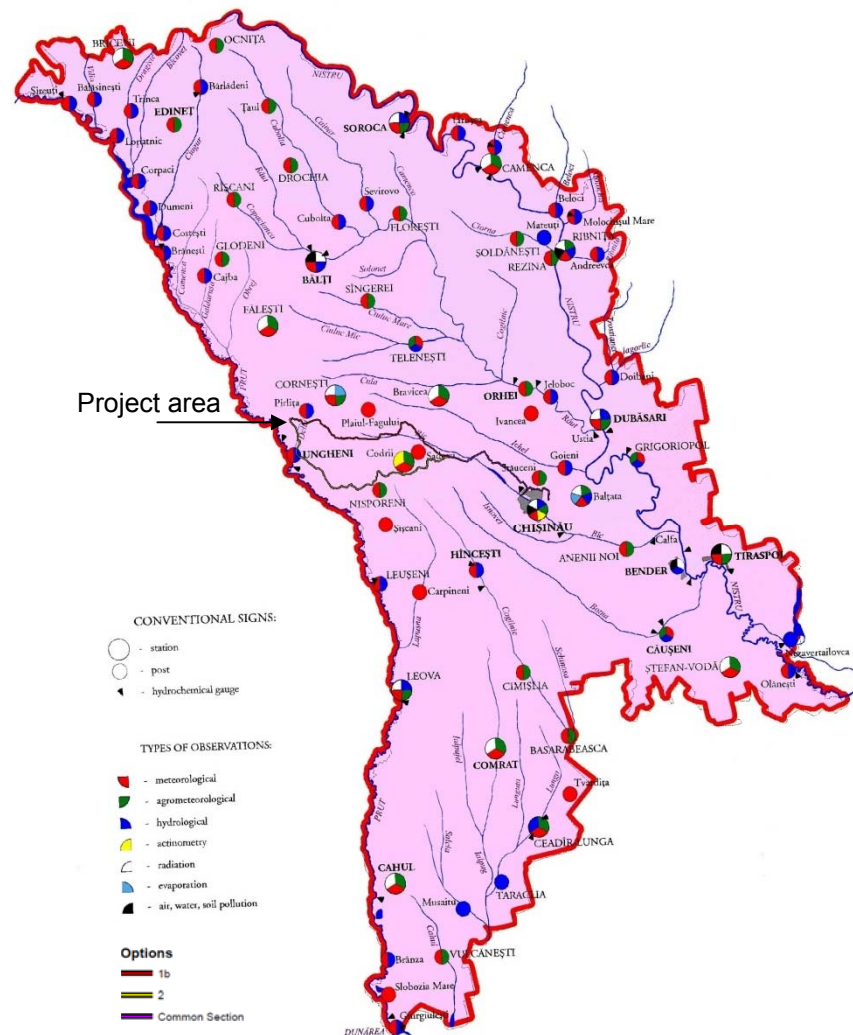
**Figure 7-3: Location of the project area within the bio-geographical Continental Zones (URL 3)**

The Continental biogeographical region is characterized among others by its continental climate, soils with naturally high fertility and widespread grassland areas which are decreasing due to intensification of agriculture. The forested area in this region is increasing but there are only little remains of natural old forest. All big carnivores exist in the region and it is an important region for birds (URL 3).

### 7.1.1 Monitoring of the physical environment in Moldova

The State Hydrometeorological Service (SHS) performs systematic ecologic monitoring of the quality of surface waters, air, soil and radioactivity, as well as meteorological and hidrological monitoring throughout Moldova (URL 4).

Figure 7-4 shows the national environmental, meteorological and hydrological monitoring network and the project's route options. Within the project area, the SHS undertakes monitoring of water, meteorology (in Ungehi, Nisporeni and Chisinau), agrometeorology (in Nisporeni), air, water, soil, radiation, and actinometry (in Chisinau).

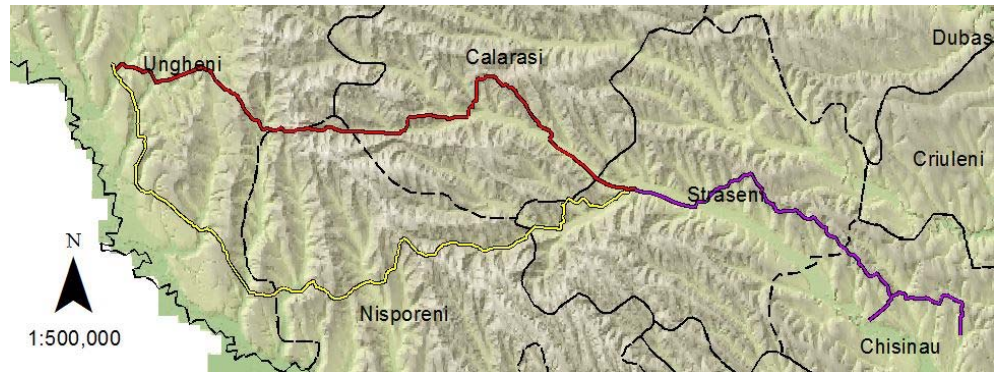


**Figure 7-4: Environmental monitoring network of Moldova and location of the project area (URL 4)**

## 7.1.2 Topography

The Republic of Moldova is described as generally hilly, gradually sloping from the north-west to the south-east. The country is landlocked, even though it is very close to the Black Sea. Moldova is cut deeply by many streams and rivers. Its altitudes vary between 5 and 430 m. The country's highest hill, the Mt. Balanesti which reaches 430 m, as well as Moldova's other hills are part of the Moldavian Plateau, which belongs geologically to the Carpathian Mountains (MoEn, year unknown).

Figure 7-5 shows the elevations map of the project area.



**Figure 7-5: Elevations map of the project area (URL 5)**

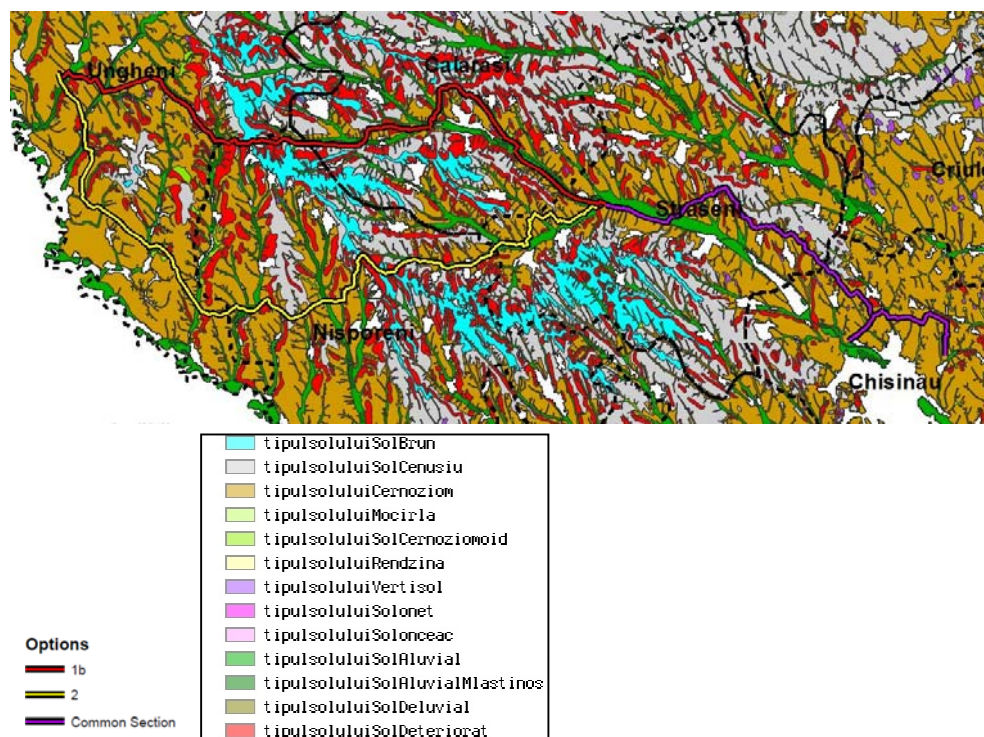
The topography of the project area can generally be described as undulating to hilly. Usually the hill tops are covered with light forest that is protected. Option 1b has altitudes varying from 52 to 397 meters above sea level (masl). Option 2 has altitudes varying from 44 to 374 masl. Mount Balanesti is situated in the north of the district Nisporeni. Option 1b runs within a distance of about 2 km from the top of this mountain.

### 7.1.3 Geology

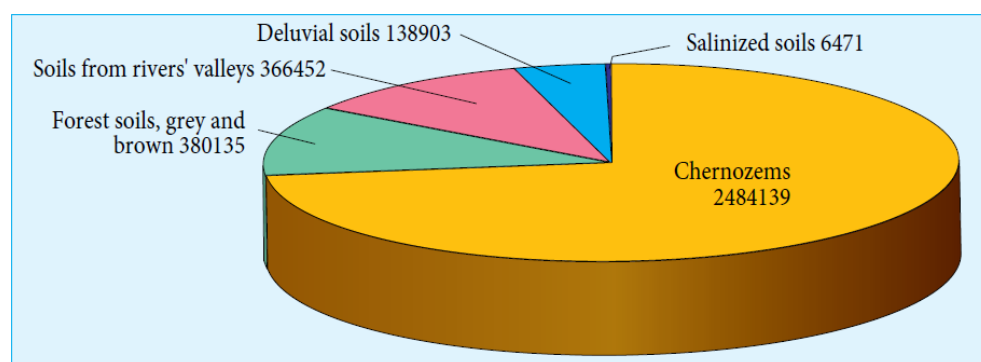
Most of Moldova's territory is a moderate hilly plateau cut deeply by many streams and rivers. Geologically, Moldova lies primarily on deep sedimentary rock that gives way to harder crystalline outcroppings only in the north. Moldova's hills are part of the Moldavian Plateau, which geologically originate from the Carpathian Mountains. Mostly pleistocene clays are found in hilly areas whereas flat plains are filled with alluvial sediments of sandy clayey silts (Fichtner and IPOT, 2014).

### 7.1.4 Soils

As shown in Figure 7-6 and Figure 7-7, the main soil type in Moldova and in the project area is chernozem, which is a black-coloured soil containing a high percentage of humus, phosphoric acids, phosphorus and ammonia. This is a very fertile soil type and produces a high agricultural yield. Chernozem occupies about 75% of the surface of Moldova.



**Figure 7-6: Soil types in the project area (URL 5)**



**Figure 7-7: Soil resources of Moldova (ha) (MoEn and MoH, 2010)**

Figure 7-6 shows that both routing options cross areas of chernozem soil for almost their entire extent. Other soil types crossed are brown soil, grey soil, alluvial soil and damaged soil.

Because Chernozem soil belongs to the most fertile soil types in the world, about 2/3 of the country's total area are subject to intense agricultural work. As a result of the heavy use of agricultural chemicals, and poor farming methods (e.g., lack of crop rotation, use of agricultural chemicals), the soil in Moldova is affected by pollution, erosion, landslides and degradation (MoEn, 2005; EBRD, 2010).

According to the data of Land Cadastre on 01.01.2010, eroded soils occupied around 877,644 ha or 25.93% of the total area of the country. The eroded soil surface increased during the last 30 years by 223,800 ha, advancing by about 6,400 ha annually. The area of land affected by ravines

is 12,049 ha, which excludes about 100 ha from the agricultural turnover every year, including 10 to 15 million m<sup>3</sup> in soil volume. Degradation of land resources is caused by landslides. Their area, according to Land Cadastre, is 24,184 ha (MoEn, 2011).

Please refer to the Map 4 in Annex 16.7 for a characterization of the eroded soils in the project area. The area of affected eroded land/landslides constitutes ca. 27% of the total construction area for both options 1b and 2. Heavily eroded areas represent 1% of the whole construction area for Option 1 and 0.5% for Option 2; moderately eroded areas represent 12% of the whole construction area for Option 1 and 8% for Option 2; low eroded areas represent 13% of the whole construction area for Option 1 and 19% for Option 2; landslide areas represent insignificant fractions of the whole construction area for both options.

Soil degradation generates a whole range of disastrous consequences: settling in the mud of aquatic basins, pollution of depressions, surface and underground waters with nutrients and pesticides washed off the slopes, destruction of the communication ways, hydro-technical constructions, infrastructure, etc. (MoEn, 2005b).

### 7.1.5 Climate

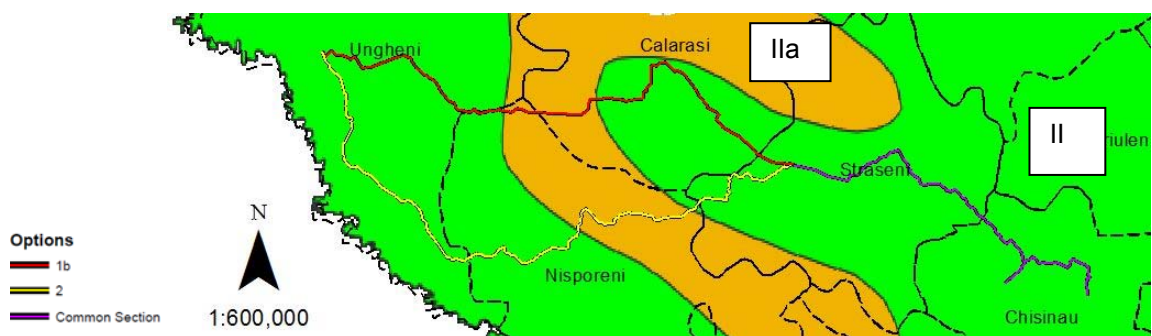
Moldova has a temperate continental climate formed mainly by the Atlantic air mass from the west and the Mediterranean air mass from the southwest. It is characterized by short mild winters, long warm summers and a high level of variability across the country. This highly variable climate creates a challenging environment for the agricultural sector, particularly for farmers of rain-fed annual crops. The nearby Black Sea and the topographic relief are also important influences on the microclimate, which determines the specialization in agriculture across the country to a significant degree

The annual mean temperature in Moldova ranges from 8°C in northern Moldova to 10°C in south-eastern districts. Precipitation generally increases from the south-east of the country to the north-west, with annual precipitation ranging from 500mm to 625mm, respectively. Although the wettest months of the year typically occur in the first half of the summer, lengthy dry spells, especially in late summer, combined with high temperatures and hot continental winds can severely stress crops and pastures during critical stages in their growth cycle.

Moldova can be divided into three major agro-ecological zones based on temperature and precipitation: Northern, Central, and Southern (The World Bank, 2010). The project is located within the Central zone, which is further divided into two sub-zones within the project area (Figure 7-8) (MoEn, 2012):

- Pedo-climatic Zone II: Terraces of the Dniester, Prut, Raut, Bic, etc. rivers;
- Pedo-climatic Zone IIa: Plain of Central Moldova and Codrii region.





**Figure 7-8: Pedo-climatic zones crossed by the project (URL 5)**

The Central Agro-Ecological Zone is characterized by the following:

- Landscape: the zone covers the Condru highland and is composed of hilly terrain and deep valleys;
- Temperature: annual mean temperature ranges from 7.5°C to 10°C;
- Precipitation: annual mean precipitation for the majority of the zone ranges from 500 to 550 mm;
- Agricultural conditions: this zone is very suitable for different types of perennial crops, including orchards and vineyards (The World Bank, 2010).

### **Climate change**

Climate change is likely to significantly affect Moldova, resulting in impacts on agriculture, as well as water management (EBRD, 2010). According to the National Climate Change Adaption Strategy of the Republic of Moldova (MoEn, 2012), changes in temperature and precipitation have been measured via the hydro-meteorological monitoring network since 1886. The data show a clear increase in both mean annual temperature and precipitation:

- during the period 1886 - 2007, the average annual temperatures have increased by approximately 1°C;
- during the same period, precipitation has increased by 60 mm, or circa 11 %.

The data show in addition that drought affects the Republic of Moldova on a recurring basis - over the 117 year period, 22 years were marked by serious drought during the vegetation period (April - September), and 18 years were marked by close to drought conditions (mild droughts).

The same document makes a vulnerability assessment of the magnitude of the risks of the climate change on agricultural production in the country.

For the Pedo-climatic zones II and IIa (Figure 7-8), where the project is located, high risks of flood increase, soil erosion, salinisation, desertification, agricultural pests, diseases and weeds due to climate change have been identified.

Medium risks for yield decrease, crop quality decrease, drought, water scarcity, and conditions for livestock production have been identified.

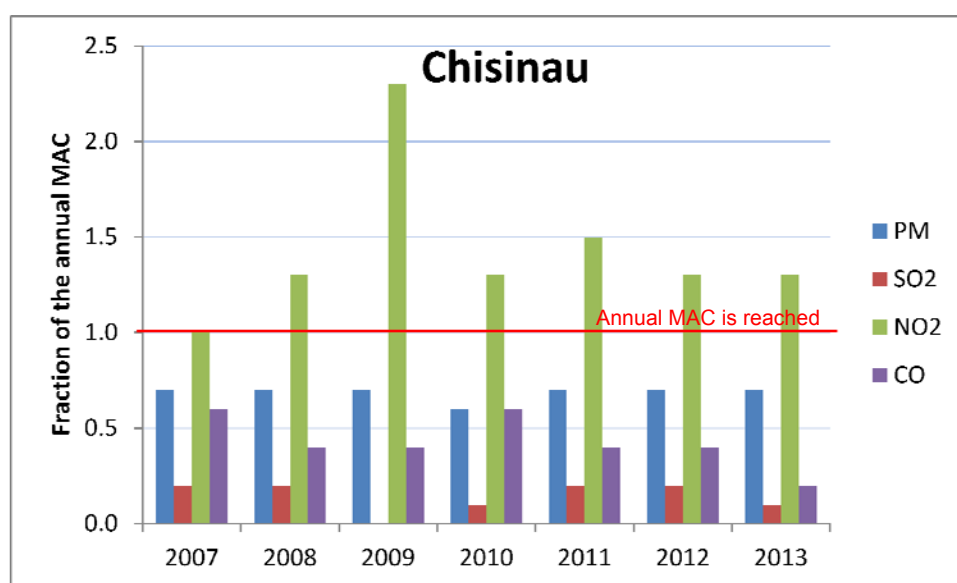
The project itself does not imply an impact on climate change (the contribution of the greenhouse gases emissions from the construction vehicles may be considered negligible). However, it does imply impacts on the soil's quality and productivity (Sections 8.1.1.1 and 8.1.1.2) which, together with the pointed risks derived from climate change may render a significant problem in the project area.

## 7.1.6 Air Quality

The main source of air pollution in Moldova is the traffic, especially of older vehicles, followed by stationary sources, of which half of the emissions are originated in thermal power plants (MoEn, 2011).

The State Hydrometeorological Service (SHS) monitors the air quality in the country through a network of 17 fixed posts located in 5 industrial regions: Chisinau - 6, Balti - 2, Beneri - 4, Tiraspol - 3 and Ribnita - 2. On a daily basis, three times per day air samples are collected, and parameters such as Sulfur Dioxide (SO<sub>2</sub>), Carbon Monoxide (CO) and Nitrogen Dioxide (NO<sub>2</sub>) are analysed (Vatamaniuc, M., 2012).

Figure 7-4 in Section 7.1.1 shows the environmental monitoring network of Moldova. Within the Ungheni-Chisinau project area, only in Chisinau measurements of air quality are undertaken. Figure 7-9 shows the fraction of the annual Maximum Allowable Concentration (MAC) reached by the pollutants particulate matter (PM), Sulfur Dioxide (SO<sub>2</sub>), Nitrogen Dioxide (NO<sub>2</sub>) and Carbon Monoxide (CO) in Chisinau.



**Figure 7-9:** Air quality in Chisinau between 2007 and 2013 - fraction of the annual Maximum Allowable Concentration (MAC) reached by some pollutants (adapted from BNS, 2014)

The graphic shows that only NO<sub>2</sub> seems to constitute a problem in Chisinau, although other data would be necessary to justify this conclusion (daily averages, for instance). The data collection method of the stations located in Chisinau is not continuous, which limits the representativity of the data obtained. Besides, the fact that these stations are located in industrial poles makes it difficult to extrapolate their results to the residential or agricultural areas crossed by the project.

#### 7.1.7 Noise

There is no monitoring of noise and vibration in Moldova (UNECE, 2014).

The main sources of noise impacting the environment in the country are highways, airports, railways, industrial enterprises, and objects located in or adjacent to residential buildings (restaurants, disco clubs, bars, cafes, sports facilities, etc.) (MoEn and MoH, 2010).

#### 7.1.8 Hydrology

Several aboveground water features are crossed by the pipeline project, or exist in its vicinity: rivers, creeks, artificial lakes, and wetlands (not Ramsar sites).

The project is located within two of the main river basins in Moldova: the Dniester River (in Romanian named Nistru River) basin and the Prut river basin (Figure 7-10). The natural water regime of the rivers in these basins has been changed by the construction of dams and reservoirs, designed to prevent floods, trap sediment, and provide water for agricultural, industrial and household consumption, as well as for fish farming (MoEn, 2012). None of these rivers is crossed by the project.



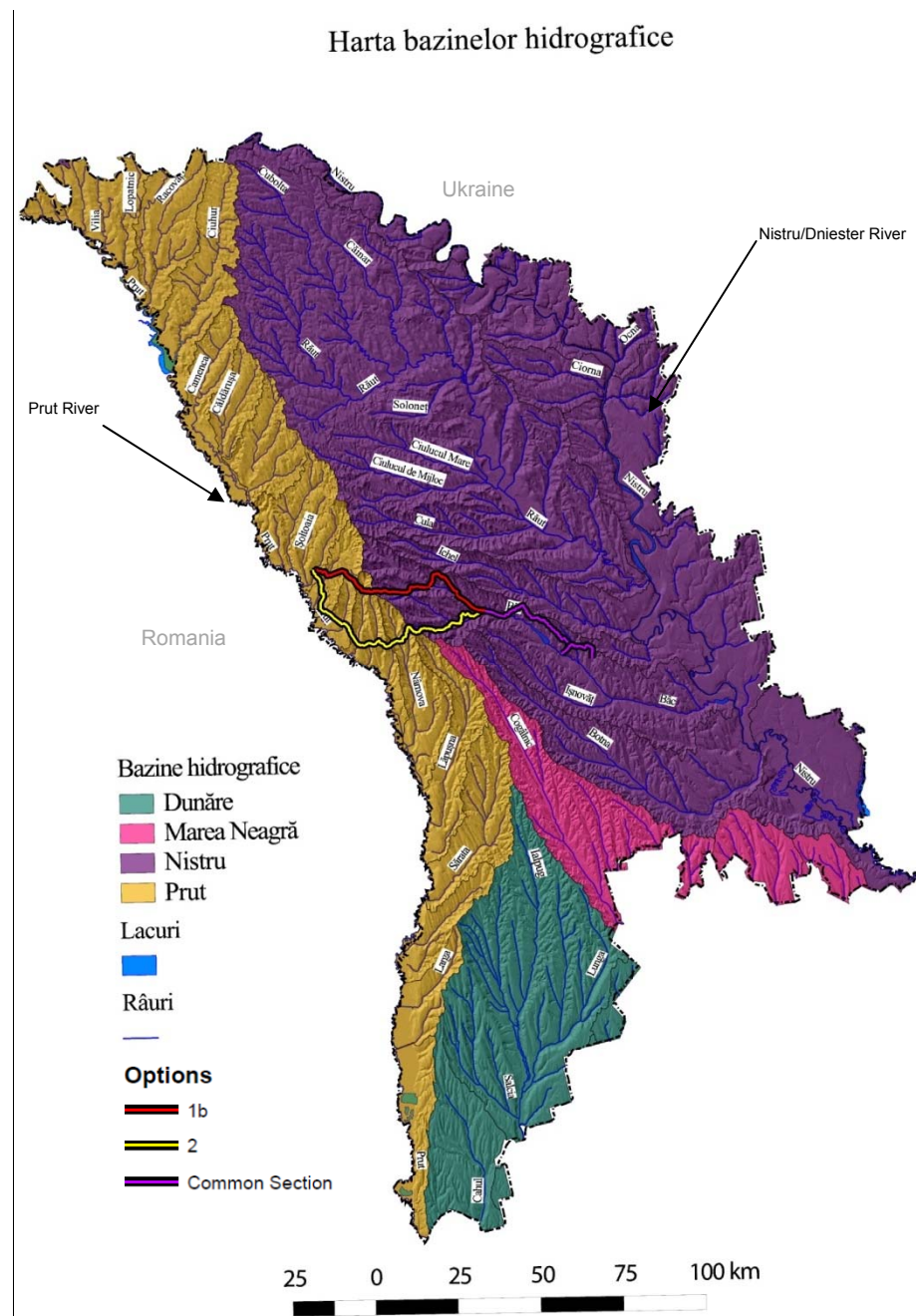
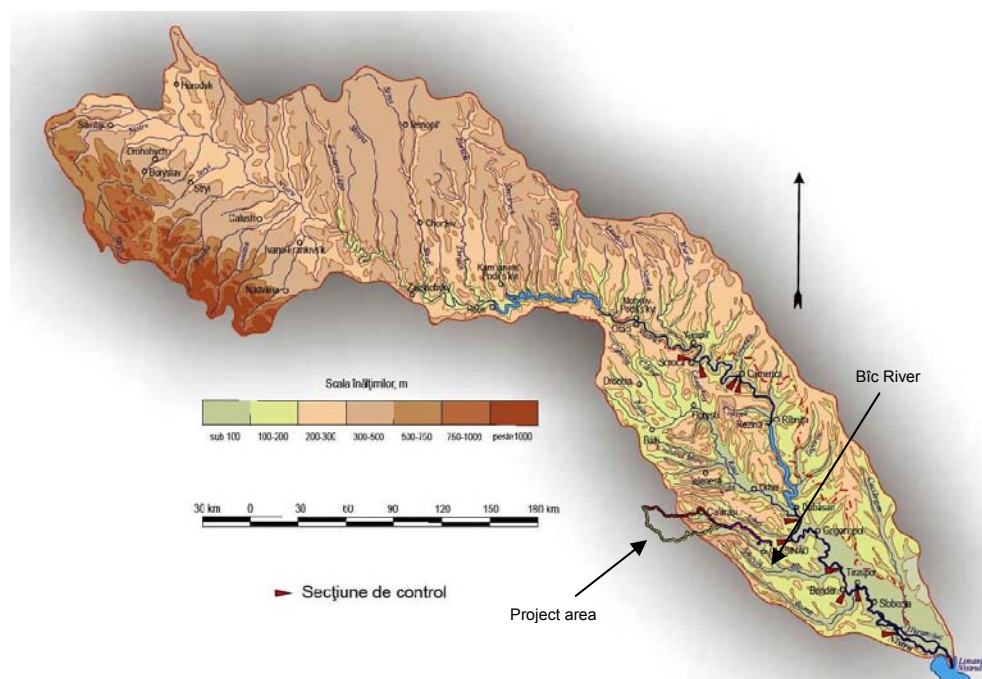


Figure 7-10: The river basins of Moldova and location of the project area

### **Dniester River basin**

The Dniester River basin is a transboundary basin shared by Moldova and Ukraine. The river basin is the fifth biggest in the Black sea region and has its largest area in Moldova. The annual average discharge rate of water is 292-316 m<sup>3</sup>/s (MoEn, 2014b).

The Dniester River serves as a drinking water supply source for the main towns located on its banks including Chisinau, the capital town of Moldova (Figure 7-11). An estimated 2.7 million people live in the Moldavian part of the Dniester basin.



**Figure 7-11: Dniester River basin and location of the project area (MoEn, 2014)**

The state of the ecosystems within the Dniester River basin significantly deteriorated during the Soviet era by intensive use of agrochemicals, uncontrolled water abstractions for different purposes, waste water discharges, among others. As there were no international mechanisms and tools for management of the river basin, practices that existed for the management of the Dniester basin are still not sufficient and strengthening of transboundary cooperation is crucially important.

The main water management issues in the Moldavian part of the Dniester basin are significant and include (GWP, year unknown):

- Nutrient load resulting in eutrophication of main water bodies due to waste water discharges (untreated or treated insufficiently) from municipalities and food processing industries.
- Hydro morphological alteration: colmatation of water bodies, interruption of the river continuity, especially on small tributaries, soil erosion (around 80% of arable lands are under different level of erosion intensity).
- Waste collection and waste management: inappropriate practices lead to pollution of water ecosystems with organic and hazardous substances.
- Natural hazards: flood and drought management issues are poorly developed in the region.

Option 1b runs in parallel to a significant extension (ca. 25 km, including the common option) to one of the tributaries of the Dniester River, the **Bîc River**. Option 1b (Figure 7-12) and Option 2 cross this river's tributaries at some points.



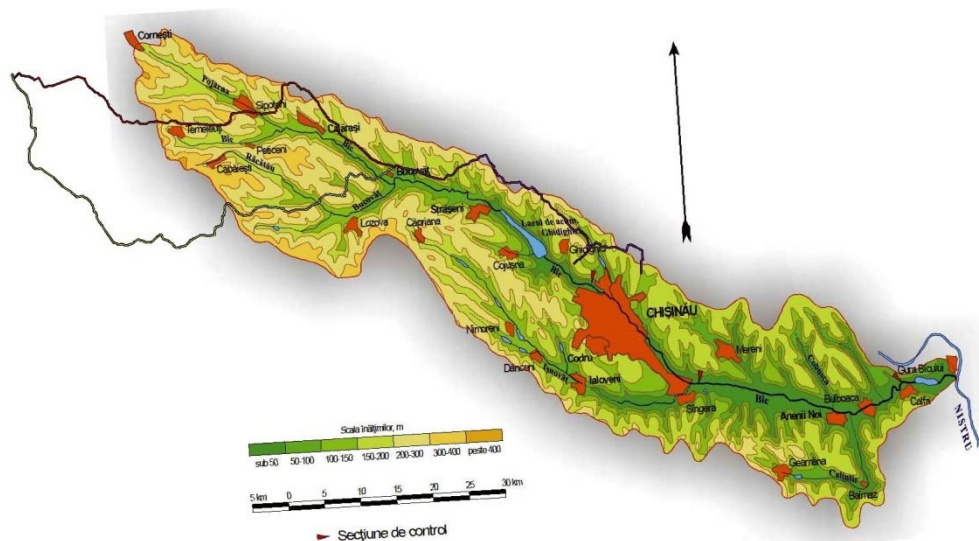
**Figure 7-12: Crossing of a narrow stem of River Bîc between APs 362 and 363 of Option 1b**

The Bîc River has a length of 155 km and a watershed area of 2,040 km<sup>2</sup>. The elevation at the source is 181 m, the width near the mouth is 6.0 m, the total drop is 175 m, the average inclination is 1.13 ‰, and the highest inclination (6.6 ‰) is registered at 6 km. The maximum discharge rate of 47.2 m<sup>3</sup>/s has been registered in 1985; the minimum of 0.002 m<sup>3</sup>/s has been registered in 1968 (Table 7-1).

**Table 7-1: Discharge rates of the river Bic (source: Ministry of Environment of Moldova)**

River	Maximum discharge rate (m <sup>3</sup> /s)	Minimum discharge rate (m <sup>3</sup> /s)
Bic	47.2 (20.06.1985)	0.002 (12.01.1968)

The Bîc River's bed (Figure 7-13) is unramified, generally weak meandering. Its mainstream has a width of 4.33 m, and the sector between Strășeni and Vatra towns is very meandering. The river width is 8 - 12 m, and its depth is 0.1- 0.2 m in some ridges, reaching up to 0.8 -1.0 m. Its speed is 0.1- 0.2 m/sec. The banks are mostly steep, with heights ranging between 0.2 and 2.5 m, and from its confluence with Ișnovăț River until Bulboaca village it reaches 7 m height. The river water is characterized by a high degree of mineralization due to the type of soil and rocks in the region where the river takes its course (MoEn, 2014).

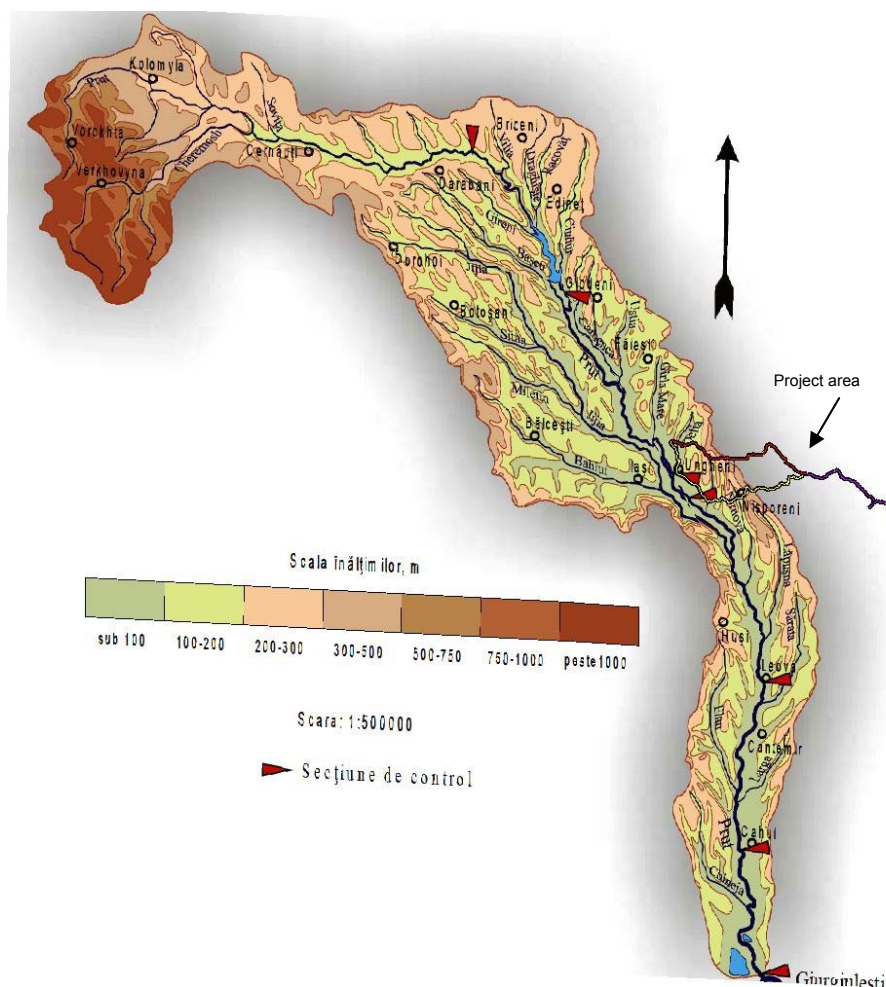


**Figure 7-13: Bîc River basin and location of the project area (MoEn, 2014)**

### **Prut River Basin**

The Prut River, a tributary of the Danube, is 967 km long and has a watershed area of 27,540 km<sup>2</sup>. According to physical and geographical features, the Prut River basin is divided into three sections: upper section (mountain) - from the source to Cernăuți town; middle section (hilly) - from Cernăuți to the mouth of Jijia river; lower section (hilly plains) - from the mouth of Jijia river to the confluence with the Danube River. The middle and lower sections flow throughout the territory of Moldova, and the upper section is located within the Ukrainian Carpathian Mountains (MoEn, 2014). The part of the project which runs within the Prut River basin is included in the middle section of the basin (Figure 7-14).





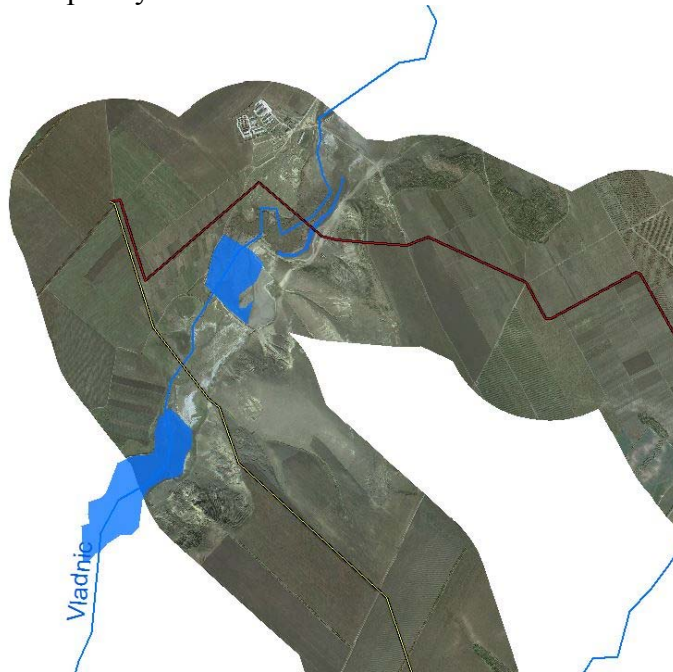
The maximum discharge rate of 47.1 m<sup>3</sup>/s in the river Delia has been registered in 1987 (Table 7-2).

**Table 7-2: Discharge rates of the river Delia (source: Ministry of Environment of Moldova)**

River	Maximum discharge rate (m <sup>3</sup> /s)	Minimum discharge rate (m <sup>3</sup> /s)
Delia	47.1 (04.07.1987)	N.A.

### **Wetlands/Lakes**

The project crosses two wetlands or lakes which are not classified as Ramsar sites. One of the lakes, crossed by both options, is located in the village of Todiresti in Ungheni, and is part of the Vladinic River (Figure 7-16 and 7-17 ). According to the site visit undertaken in October 2014, this is a temporary formation.



**Figure 7-16: Lake/wetland crossed by Option 1b (red line) and Option 2 (yellow line) in Todiresti, Ungheni (satellite image)**



**Figure 7-17: Lake/wetland crossed by Option 1b (red line) and Option 2 (yellow line) in Todirești, Ungheni (pictures)**

The second lake is crossed only by Option 2 and is located in the village of Varzaresti, in Nisporeni (Figure 7-18).





**Figure 7-18:** Lake/wetland crossed by Option 2 (yellow line) in Varzaresti, Nipsoreni

### **Water quality**

Moldova has a serious problem with water quality. The rivers reaching Moldova have a relatively good quality but within the country become moderately polluted, and can be highly polluted in some industrial areas. The rivers Dniester and Prut account for a significant amount of the potable water supply in Moldova, but do not pass quality standards in many cases, showing the presence of heavy metals, ammonia and nitrates significantly over the allowable limits. Sources of water pollution are primarily from agricultural and industrial use and storage (EBRD, 2010).

## **7.1.9 Hydrogeology**

Sub-surface waters are the main source of potable water supply in the Republic of Moldova for 100% of the rural population and 30% of the urban population, representing 65% of the total population of the country. The remaining 35% of the population uses surface waters as a source of potable water, including 32% from the Dniester River, 2.8% from the Prut River and 0.2% from other surface waters (URL 6).

About 7 thousand boreholes of different aquifer horizons are exploited on the whole territory of the country (MoEn, year unknown). This includes confined (deep), unconfined and perched aquifers.

The main groundwater reserves in Moldova are located in *deep confined aquifers*. The natural recharge capacity of the confined aquifers is limited, and there is a risk of overexploitation (URL 6).



Groundwaters from *unconfined* and *perched aquifers* are used locally in rural areas in the absence of a centralized water supply system (UNDP, 2009). This is the case of the project area - as discussed further in Section 7.3.8, except for the Municipality of Chisinau, less than 50% of the households in the project area has access to centralized water supply.

The site visit to the project area was undertaken after a long dry period. Due to this, only little evidence of high groundwater levels has been found. In the hills no or only little groundwater will occur during trenching, but in the valleys groundwater will be expected close to ground level. On sandy soils high groundwater level open trenching without shoring might not be possible. These areas shall be identified by a due soil investigation.

#### **Underground water quality**

Monitoring of underground water has been carried out at several boreholes throughout the whole country. According to the results, the condition of water in wells throughout the whole country fails to meet the “Potable Water” standard. On average, 87% of water tests from the phreatic layer (*unconfined aquifers*) contain nitrates that exceed the Maximum Allowable Concentration (MAC) by up to ten times. The main sources of pollution are the deposition of waste in the neighbourhood of the water sources, infiltrations from landfills, non-functioning wastewater treatment plants, and improvised holes for household waste (MoEn, year unknown). Investigations indicate a strong correlation between groundwater quality in unconfined aquifers and land use (URL 6).

Water quality in *confined aquifers* is influenced mainly by local geological conditions. However, there are signs that the human factor plays an increasingly significant role in polluting water in these aquifers through infiltration of polluted waters and through abandoned boreholes (UNDP, 2009). Despite the lower abstraction of groundwater following the economic downturn, an increasing number of deep groundwater sources in Moldova are polluted with nitrogen compounds and so is the water in centralized water supply systems in several towns (MoEn, 2005).

### **7.1.10 Landscape**

The terrain in the project area may be classified into three categories:

- a) Plains: Generally dry flat or undulating terrain with light coverage of trees and bushes or agriculturally used land, pastures used for livestock.
- b) Marsh: Low lying areas, mostly adjacent to several small rivers, which can be flooded in the rainy season. Ground generally covered by tall grass and water reeds.
- c) Hills: Area dominated by sequence of hills with a altitude range between 100 m and 400 m above sea level lightly covered with trees and bushes. Particular for this terrain are short but steep slopes.

Most of the land affected by the proposed routes is used for agriculture or as pasture. Not only annual but also perennial crops as grapes and fruits are produced. Especially vineyards are very common. Options 1b and 2 cross and run nearby the following landscape features:

- Different rivers and floodplains;
- Lakes;
- Roads and railways;
- Hills;
- Marshes;
- Steep slopes;
- Agricultural fields (ephemeral plantations, vineyards and orchards).

Figure 7-19 shows some pictures of the project area (October 2014), indicating the presence of some of the above listed landscape features.

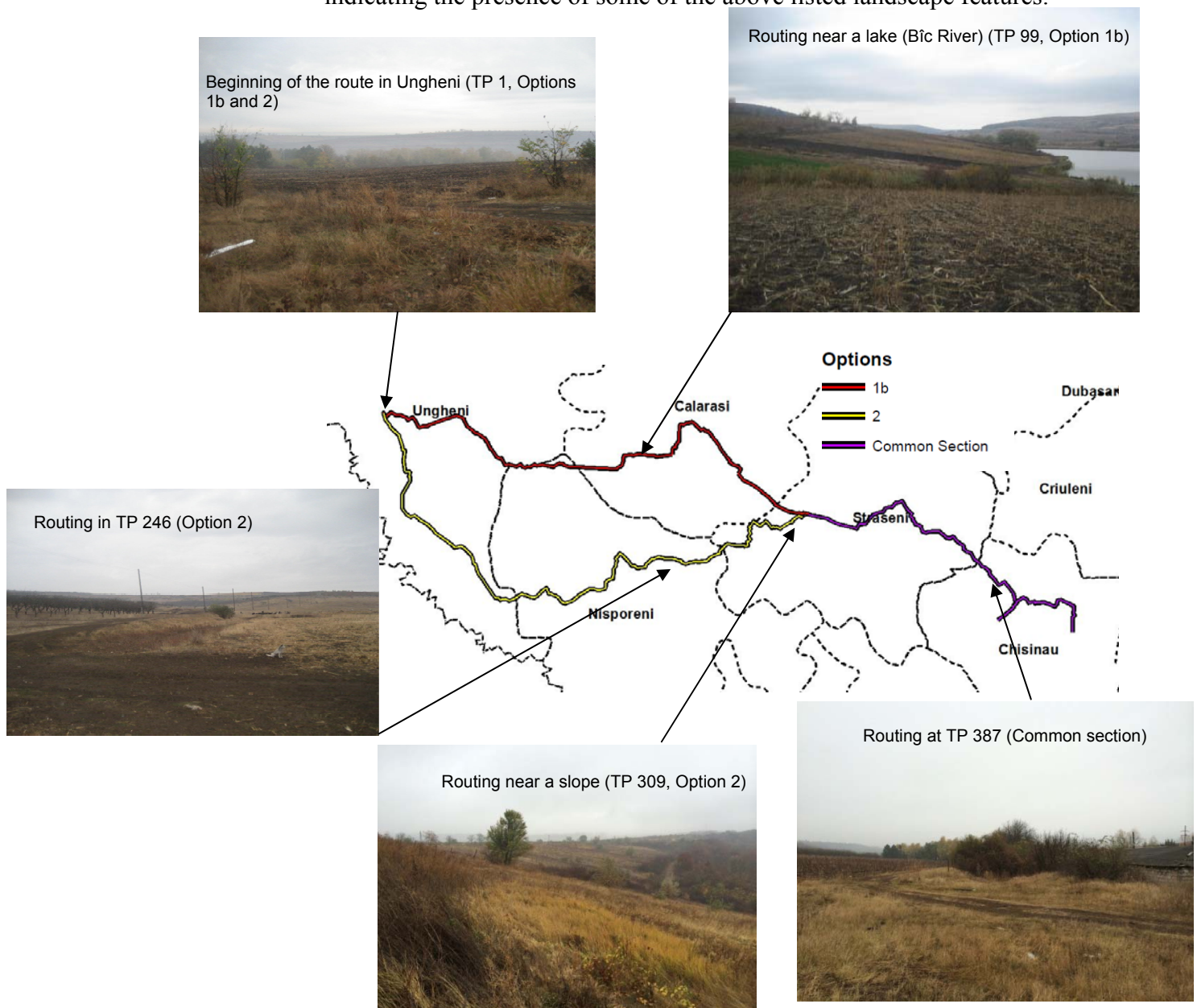


Figure 7-19: Pictures of the project area (site visit undertaken in October 2014)

## 7.2 Biological environment

### 7.2.1 Protected areas

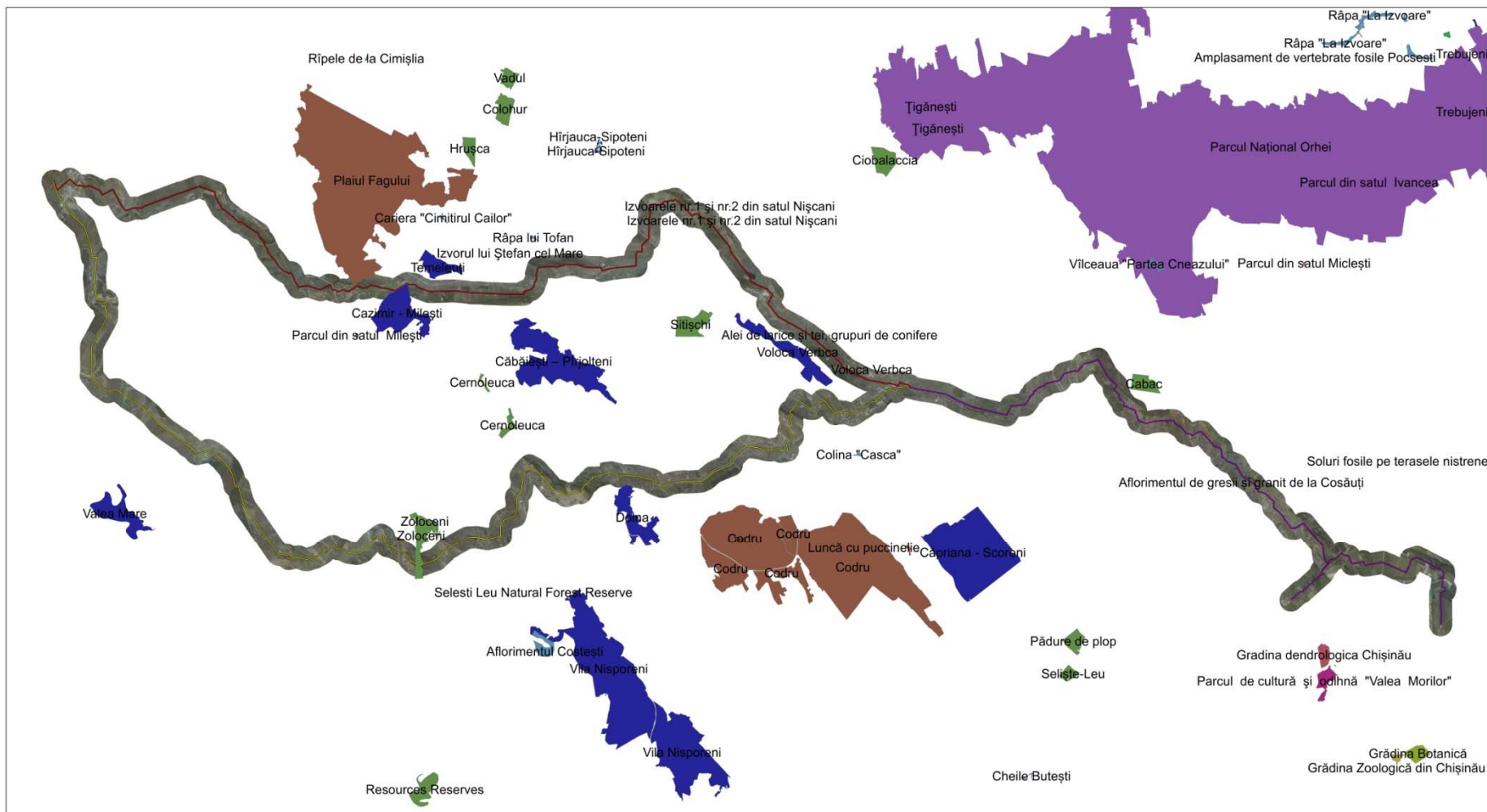
Currently there are 307 protected areas (PAs) in Moldova, with a surface of ca. 157,600 ha, or 4.65% of the national territory. The existent protected areas in Moldova are divided into 10 categories. Within these, 6 categories match the IUCN classification, 3 categories are national and one category is international (Ramsar sites) (MoEn, 2011). From the 307 PAs in Moldova, 66 are included in the official UN List of Protected Areas (URL 8).

Table 7-3 below, Map 8 in Annex 16.7 and Figure 7-20 below show the closest PA to the project area based on data from the State Planning Institute for Land Management (IPOT). The approximate distance to the pipeline axis is shown in Table 7-3.

**Table 7-3: Protected areas in the vicinity or within the project area**

Category of PA	Name of PA	District	Approx. distance (km)	Routing option
Landscape Reserve	Temeleuți	Calarasi	0.7	1b
	Căbăiești – Pîrjolteni	Calarasi	1.4	1b
	Voloca Verbca	Calarasi	1	1b
	Cazimir - Milești	Nisporeni	0 (along the border)	1b
	Dolna	Straseni	0.5	2
Natural Forest Reserve	Seliște-Leu	Nisporeni	Crossed	2
	Cabac	Straseni	0.8	1b/2
Scientific Reserve	Plaiul Fagului	Ungheni	3	1b
		Calarasi	2.3	1b
		Nisporeni	0.1 (buffer * is crossed)	1b
Hydrological Natural Monuments	Izvorul lui Ștefan cel Mare	Calarasi	1.8	1b
	Izvoarele nr.1 și nr.2 din satul Nișcani	Calarasi	1.2/1.4	1b
Monuments Geology & Paleontology	Râpa lui Tofan	Calarasi	1.7	1b
	Aflorimentul de gresii și granit de la Cosăuți	Straseni	0.2	1b/2
Landscape Architecture Monuments	Alei de larice și tei. grupuri de conifer	Calarasi	0.6	1b

\* The Scientific Reserve Plaiul Fagului has a buffer with 1,5 km width (please refer to Section 4.1.5 of this ESIA)



**Figure 7-20: Protected Areas in the vicinity of the project Area**

The pre-feasibility and scoping stages of the project allowed the determination and refinement of the route in such a way to avoid to the maximum the crossing of particularly sensitive areas, such as natural protected areas. However, as highlighted in red in Table 7-3, it was not possible to avoid:

- crossing the natural forest reserve Seliște-Leu, in Nisporeni (Option 2);
- bordering the landscape reserve Cazimir - Milești in Nisporeni (Option 1b);
- running nearby (100 m) the Plaiul Fagului scientific reserve in Nisporeni (Option 1b), and crossing its protective buffer as defined in the Government Decision No. 167 of 12.03.1992.

Data on the animal and plant species living within these three reserves have been obtained from Moldsilva and BIOTICA Ecological Society. The lists of species which are under protection of national and/or international instruments and that live within these reserves can be consulted in Annex 16.1. A summary thereof can be read in the following sub-sections. A description of the protection instruments has been made in Section 4 of this ESIA.

#### 7.2.1.1 Plaiul Fagului

The Government Decision No. 167 of 12.03.1992 establishes the Plaiul Fagului Scientific Reserve (Section 4.1.5 of this ESIA), but only in 1998 the Law on Protected Areas No. 1538 XIII establishes legal grounds for setting up and functioning of reserves of protected areas (Section 4.1.4 of this ESIA).

Being a Scientific Reserve, and according to the above listed legal documents, Plaiul Fagului has a status of a scientific research institute. The main objectives of the creation of this reserve are to protect the environment (conservation, regeneration and ecological recovery), carry out scientific research and provide education and training for the population.

Within the Plaiul Fagului scientific reserve, among the protected mammal species one can find small shrews, rodents, bats, one species of otter, one species of feline and different species of deer. Two of these species are listed in the IUCN Red List as Near Threatened: Speckled Ground Squirrel and Eurasian Otter. The Bicolored Shrew and the Eurasian Otter are classified as Critically Endangered in the Moldova Red Book. Other species are classified in the Moldova Red Book as Endangered and Vulnerable.

A large number of protected bird species nest, winter, or pass by/ this reserve and these include large birds such as storks, swans, geese and cranes, but also small birds like woodpeckers. Protected ducks, owls and birds of prey also live in this reserve. The different birds use the reserve for different purposes including nesting, wintering, and seasonal stay. Several of the species within this reserve are listed in Annex I of the Birds Directive

(species subject of special conservation measures), others are strictly protected by the Bern Convention, and others are classified as Critically Endangered, Endangered and Vulnerable by the Moldova Red Book and/or the IUCN Red List.

Amphibians such as toads and frogs, and reptiles such as turtles, lizards and snakes can be found in the Plaiul Fagului scientific reserve. From these, only one species is considered Near Threatened by the IUCN Red List: European Pond Turtle. Most of the protected amphibians and reptiles are listed in Annex IV of the Habitats Directive, meaning that they are in need of strict protection.

Several species of beetles live in the reserve. Three of them are classified as Vulnerable and one is classified as Near Threatened by the IUCN.

From the plant species, a relatively large number of orchid and fern species is listed in the Moldova Red Book as Endangered, Critically Endangered or Vulnerable. No plant is identified under any level of threat within the IUCN Red List.

Table 7-4 presents the list of animal and plant species classified within the Moldova Red Data Book and within the IUCN Red List (with a classification above LC) that live in the reserve Plaiul Fagului. The assessment of impacts and definition of mitigation measures is particularly focused on these species.

**Table 7-4: Protected species living in the reserve Plaiul Fagului (only Moldova Red Book and IUCN Red List)**

Class	Species	Common name	Moldova Red Data Book 2001	IUCN Red List 2013
Mammals	<i>crocidura leucodon</i> H.	Bicolored Shrew	CR	LC
	<i>Spermophilus suslicus</i> Güld.	Speckled Ground Squirrel		NT
	<i>mustela erminea</i> L.	Stoat	VU	LC
	<i>martes martes</i> L.	Pine Marten	VU	LC
	<i>lutra lutra</i> L.	Eurasian Otter	CR	NT
	<i>Felis silvestris</i> S.	Wild Cat	EN	LC
Birds	<i>ardea alba</i> L.	Great White Egret	CR	LC
	<i>ciconia nigra</i> L.	Black Stork	CR	LC
	<i>cygnus olor</i> Gmel.	Mute Swan	VU	LC
	<i>aythya nyroca</i> Güld.	Ferruginous Duck		NT
	<i>pernis apivorus</i> L.	European Honeybuzzard	EN	LC
	<i>circaetus gallicus</i>	Short-toed	CR	LC

Class	Species	Common name	Moldova Red Data Book 2001	IUCN Red List 2013
	Gmel.	Snakeeagle		
	circus cyaneus L.	Hen Harrier	CR	LC
	circus pygargus L.	Montagu's Harrier	CR	LC
	clanga pomarina Brehm	Lesser Spotted Eagle	CR	LC
	clanga clanga Pall.	Greater Spotted Eagle	CR	VU
	aquila chrysaetos L.	Golden Eagle	CR	LC
	hieraaetus pennatus Gmel.	Booted Eagle	CR	LC
	falco vespertinus L.	Red-footed Falcon		NT
	falco cherrug Gray	Saker Falcon	CR	EN
	columba oenas L.	Stock Dove	EN	LC
	asio flammeus Pont.	Shorteared Owl	EN	LC
	dryocopus martius L.	Black Woodpecker	EN	LC
Amphibians and Reptiles	orbicularis L.	European Pond Turtle		NT
Insects	Mantis religiosa L.	praying mantis	EN	
	Calosoma sycophanta L.	forest caterpillar hunter	CR	
	Porthmadius austriacus Shr.		CR	
	Oryctes nasicornis L.	European rhinoceros beetle	EN	
	Lucanus cervus L.	Stag beetle	EN	
	Cerambyx cerdo L.	capricorn beetles	EN	VU
	Morimus funereus Muls.		EN	VU
	Rosalia alpina L.	Rosalia longicorn	CR	VU
	Xylocopa valga Gerst.	Species of carpenter bee	EN	
	Saturnia pyri Den. et Sch.	giant peacock moth	EN	
	Marumba quercus Den. et Sch.	Oak Hawk-moth	EN	

Class	Species	Common name	Moldova Red Data Book 2001	IUCN Red List 2013
	Callimorpha quadripunctaria Poda	Jersey Tiger (moth)	VU	
	Iphiclides podalirius L.	Scarce Swallowtail	VU	
	Papilio machaon L.	Old World swallowtail	CR	
	Carabus intricatus L.	Blue Ground Beetle		NT
Plants	Athyrium filix-femina (L.) Roth	common ladyfern	VU	
	Cephalanthera damasonium (Mill.) Druce	White Helleborine	VU	
	Cephalanthera longifolia (L.)	Sword-leaved	VU	
	Cephalanthera rubra (L.) Rich.	RedHelleborine	CR	LC
	Chrysopogon gryllus (L.) Trin.	perennial bunchgrass	VU	
	Cypripedium calceolus L.	lady's slipper orchid	CR	LC
	Dactylorhiza majalis (Reichenb.) P.F.Hunt et Summerhayes	Heart Shaped Lip Dactylorhiza	CR	LC
	Daphne mezereum L.	February daphne	CR	
	Dentaria glandulosa Waldst. et Kit.		VU	
	Dentaria quinquefolia Bieb.		EN	
	Doronicum hungaricum Reichenb.fil.		VU	
	Dryopteris carthusiana (Vill.)	narrow bucklerfern	EN	
	Epipactis purpurata Smith	Violet Helleborine	VU	LC
	Euonymus nana Bieb.	Turkestan Burning Bush	VU	
	Galanthus nivalis L.	Common Snowdrop	VU	NT
	Genistella sagittalis (L.) Gams	Common winged broom	CR	LC
	Gymnocarpium dryopteris (L.) Newm.	Western Oakfern	CR	
	Hypopitys monotropa Crantz	Dutchman's pipe	CR	



Class	Species	Common name	Moldova Red Data Book 2001	IUCN Red List 2013
	Lunaria rediviva L.	perennial honesty	EN	
	Maianthemum bifolium (L.)	May lily	CR	
	Orchis palustris Jacq.	bog orchid	EN	LC
	Orchis purpurea Huds.	lady orchid	EN	
	Padus avium Mill.	Bird Cherry	EN	
	Polystichum aculeatum (L.) Roth	Hard Shield Fern	EN	
	Scopolia carniolica Jacq.	European scopolia	VU	
	Sorbus domestica L.	service tree	EN	
	Thelypteris palustris Schott	marsh fern	EN	LC

#### 7.2.1.2 Cazimir-Milesti

The landscape reserve Cazimir - Milesti has no management plan associated, but the protection objectives of landscape reserves are defined in the Law No. 1538 XIII (Law on Protected Areas). According to Article 43 of this law, these reserves have the objective of allowing the conservation of geographical landscape of national importance, regulating their use for economic, aesthetic, cultural and recreative purposes. Scientific research is carried within the landscape reserves.

While this reserve is not designated for protection of wildlife, two animal species present are classified by the IUCN Red List in a level higher than Least Concern. These are the European Turtle Dove (Vulnerable) and the European Pond Turtle (Near Threatened).

Some plant species are included in the Moldova Red Book and are classified using the levels II to IV of the Law on Protected Areas (Endangered, Vulnerable and Rare). None of these species is included in the IUCN Red List as possessing a classification higher than Least Concern.

From the bird species, none is included in the Moldovan Red Book and none is classified using the levels I to IV of the Law on Protected Areas (Extinct, Endangered, Vulnerable and Rare). The reverse is true for the insect species.

Table 7-5 presents the list of animal and plant species classified within the Moldova Red Data Book and within the IUCN Red List (with a classification above LC) that live in the reserve Cazimir-Milesti. The assessment of impacts and definition of mitigation measures is particularly focused on these species.

**Table 7-5: Protected species living in the reserve Cazimir-Milesti (only Moldova Red Book and IUCN Red List)**

Class	Species	Common name	Moldova Red Data Book 2001	IUCN Red List 2013
Mammals	<i>martes martes</i> L.	Pine Marten	VU	LC
	<i>Felis silvestris</i> S.	Wild Cat	EN	LC
Birds	<i>Streptopelia Turtur</i> L.	European turtle dove		VU
	<i>Emys orbicularis</i> L.	European Pond Turtle		NT
Insects	<i>Oryctes Nasicornis</i> L.	European rhinoceros beetle	EN	
	<i>Lucanus Cervus</i> L.	Stag beetle	EN	
	<i>Iphiclidus Podalirius</i> L.	Scarce Swallowtail	VU	
	<i>Xylocopa Valga</i> Gerst.	Species of carpenter bee	+	
	<i>Zerynthia Polyxena</i> D.&S.	Southern Festoon	+	
Plants	<i>Cephalanthera Damasonium</i> Mill.	White Helleborine	+	
	<i>Cephalanthera Longifolia</i> L.	Narrow-leaved Helleborine	+	
	<i>Dentaria Glandulosa</i> Waldst. et Kit		+	
	<i>Scopolia Carniolica</i> Jacq.	European scopolia	+	

+ : present in the Red Data Book, status unknown

### 7.2.1.3 Seliște-Leu

The Natural Reserve Seliște-Leu has been created with the aim to ensure conditions of optimal protection and restoration of species, plant communities and animals of national importance (Law on Protected Areas, Article 40). Scientific research is conducted in natural reserves. Seliște-Leu has no management plan associated.

There are no plant or animal species within the Seliște-Leu reserve which are classified by the IUCN Red List in a level higher than Least Concern.

The Wild Cat and the 4 protected insect species are classified as Vulnerable by the Moldovan Law on Protected Areas. The same law classifies two plant species as Endangered: the shrub European bladdernut, and the flower Lesser Periwinkle.

Table 7-6 presents the list of animal and plant species classified within the Moldova Red Data Book and within the IUCN Red List (with a classification above LC) that live in the reserve Cazimir-Milesti. The assessment of impacts and definition of mitigation measures is particularly focused on these species.

**Table 7-6: Protected species living in the reserve Seliște-Leu (only Moldova Red Book and IUCN Red List)**

Class	Species	Common name	Moldova Red Data Book 2001	IUCN Red List 2013
Mammals	<i>Felis silvestris</i> S.	Wild Cat	EN	LC
Amphibians and Reptiles	<i>Coronella austriaca</i> Laur.	Smooth Snake	EN	
	<i>Vipera berus</i> L.	Northern Viper	EN	
Insects	<i>Oryctes Nasicornis</i> L.	European rhinoceros beetle	EN	
	<i>Lucanus Cervus</i> L.	Stag beetle	EN	
	<i>Saturnia Pyri</i>	Giant peacock moth	EN	
	<i>Iphiclides Podalirius</i> L.	Scarce Swallowtail	VU	
Plants	<i>Fritillaria meleagris</i> L.	snake's head	+	

+ : present in the Red Data Book, status unknown

#### 7.2.1.4 Ramsar sites

Moldova has three wetlands of international importance, or Ramsar Sites: Lower Dniester, Lower Prut Lakes and Unguri-Holosnita. All these sites are located far away from the project area and are, as therefore, not impacted by its construction or operation.

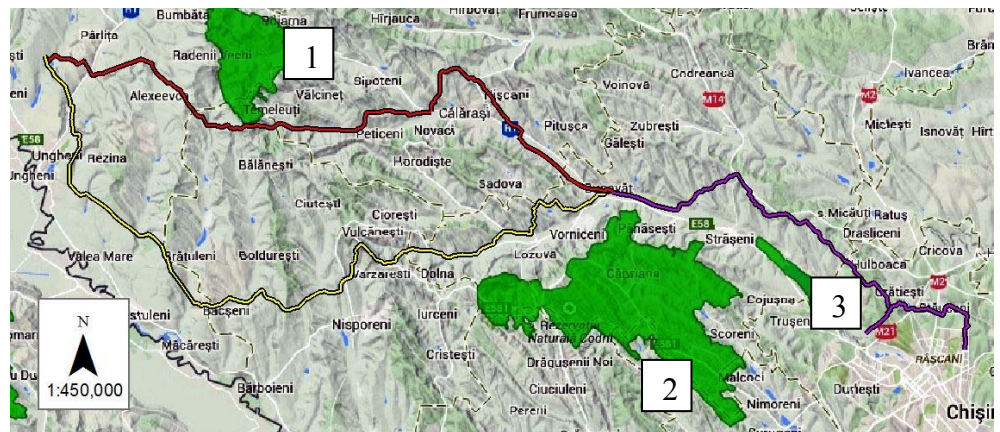
#### 7.2.1.5 IBAs

Important Bird and Biodiversity Areas (IBAs) are areas established by Birdlife International as being a globally important habitat for the conservation of the world's birds and other wildlife. There are twelve Important Bird Areas in Moldova. From these, three are located close to the project area (**Figure 7-21** and **Table 7-7**):

1. Plaiul Fagului
2. Codrii
3. Bazinul Ghidighici

**Table 7-7: Important Bird Areas in the vicinity of the project area**

Options	IBA 1	IBA 2	IBA 3
Option 1b	0.1 km	2.4 km	--
Option 2	16 km	2.2 km	--
Common section	--	1.1 km	2.2 km



**Figure 7-21: IBAs in the vicinity of the project area**

The data show that Option 1b passes 100 meters away from the IBA associated with the Plaiul Fagului scientific reserve in Nisporeni. The bird species living within this IBA/scientific reserve can be consulted in Annex 16.1. The other IBAs are located in distances varying between 1.1 and 16 km from the project site.

## 7.2.2 The National Ecological Network of the Republic of Moldova

The National Ecological Network (NEN) of the Republic of Moldova is a project implemented by the IUCN and BIOTICA Ecological Society, in cooperation with the Ministry of Environment of the Republic of Moldova and with the financial support of the Norwegian Ministry of Foreign Affairs (URL 9).

By integrating a national corridor plan with the Pan-European Ecological Network, the objective of the NEN is to provide optimal conservation and restoration of biological and landscape diversity, as well as create the prerequisites for sustainable agriculture in Moldova. This includes a reduction in soil erosion and improvements to the hydrological regime and water quality (Jodi A. Hilty *et al.*, 2006).

The Ecological Network identifies areas of high natural value and those that need to be surveyed, as well as sites designated for restoration. Specifically, the following areas are part of the NEN:

- Core areas: an area of special value to the conservation of an ecosystem, habitats, species and landscapes. Core areas of appropriate level and functional significance can already be designated under other international systems determined by conventions and agreements to which Moldova is or will be party (Ramsar areas, EU Habitat Directive “Natura-2000”, Emerald Network, etc.).
- Ecological corridors: continuous or discontinuous components of an Eco-Network that ensure territorial or functional links between other

components, or their inter-connection on a higher level. Physiognomic types of corridors are linear, stepping-stone and landscape.

- Restoration areas: a territory intended for biological and/or geomorphological restoration (forestation, restoration of grass cover, topsoiling, land reclamation) as a future core or buffer area, or a ecological corridor.
- Buffer zones: an area performing the function of maintaining and protecting a core area, or that has special relevance to the geo-systemic balance (URL 10).

The creation of the NEN has been made under the basis that, if the above identified areas are protected and restored, the remaining natural resources will be protected and continued desertification will be prevented (Jodi A. Hilty *et al.*, 2006). In functional terms, the network is intended to achieve the following objectives:

- maintaining ecosystems, habitats, species and landscapes at the national, regional and global scale;
- maintaining and restoring the integrity of, and the connections between, core areas;
- protecting and enhancing natural resources within ecological systems;
- improving the stability of agricultural ecosystems, including, where appropriate, their restoration;
- stabilizing the effects of climate change;
- maintaining and improving the recreational value of national ecosystems;
- stimulating tourism, especially eco-tourism;
- encouraging public involvement in nature conservation;
- developing a system of biological monitoring (Bennett, G. and Mulongoy, K.J., 2006).

The development of the concept of the National Ecological Network of Moldova requires the application of operational checklists (OCLs), necessary for estimating the value of potential areas for protection. OCLs are based on:

- data and expert opinions concerning threatened species in Moldova;
- materials from other countries, whose areas include the Moldavian biogeographical regions;
- official international lists of threatened species, as far as they are relevant to Moldova.

They comprise species recently extinct in Moldova with absolute or extremely high probability and species that correspond to different threatened categories (URL 10).

### **The NEN and the Ungheni-Chisinau pipeline project**

The projected pipeline traverses some components of the National Ecological Network, namely:

- Core areas:
  - Option 1b passes very closely (100 m) to the core area **Plaiul Fagului** (this core area corresponds to the Scientific Reserve and the IBA with the same name);
  - Option 2 crosses the core area **Seliște - Leu** (this core area corresponds to the Natural forest reserve with the same name);
  - Option 1b borders the core area **Cazimir - Milești** (this core area corresponds to the Landscape Reserve with the same name);
- Ecological corridors:
  - Both Options 1b and 2 cross one planned national ecological corridor between the core areas **Plaiul Fagului** and **Codrii**.

Maps 1, 2 and 3 in Annex 16.7, as well as Figure 7-22 below show the location of the project and its interaction (crossing and bordering) with the NEN core areas and ecological corridors. The list of protected species living in these core areas and reserves can be consulted in Annex 16.1.

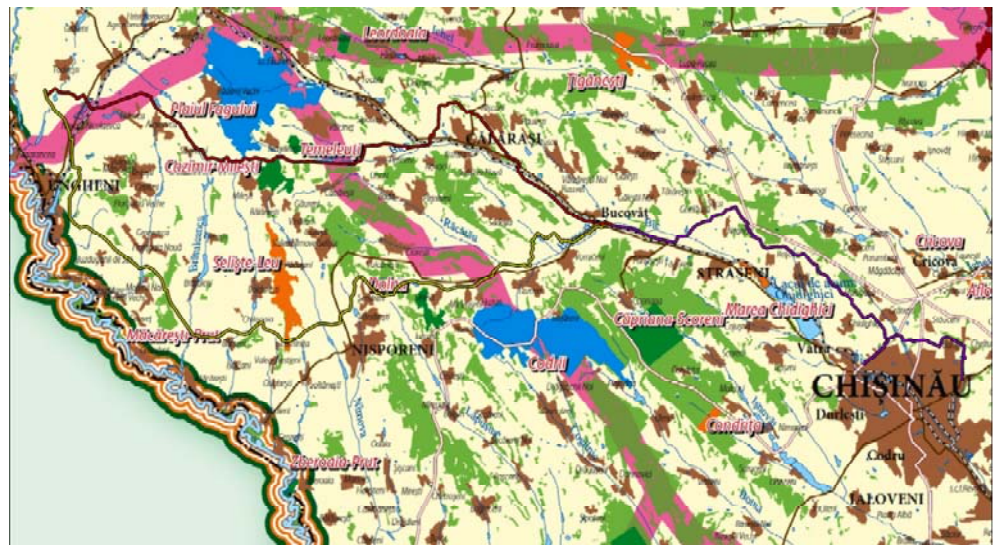


Figure 7-22: Ecological corridor crossed by both options (in pink)

The NEN maps show that the pipeline (Option 1b) is expected to run nearby the **Plaiul Fagului Scientific Reserve** (100 meters distance), which is in addition a national importance core area as per the NEN. Within this reserve and core area, a “very high” number of mammals, and a “high” number of insects and highest plants have been identified by the NEN (Map 1). From these, a “very high” number of mammals is protected by the Bern Convention, a “high” number of insects is included in the IUCN Red List and a “high” number of higher trees is considered threatened as per the Moldovan Law (Map 2).

The maps also show that Option 2 crosses directly the **Seliște-Leu Natural forest reserve** in Nisporeni. This reserve is part of the local importance core area Selisti-Leu. This crossing is planned to be made parallel to an existing

pipeline. Due to the safety distance that shall be kept between the two pipelines, an additional fall of trees is expected in this area. The Selesti-Leu core area has lower numbers of biodiversity values and target species than the Plaiul Fagului Reserve (Maps 1 and 2).

Also in Nisporeni, the **Landscape Reserve Cazimir - Milești** is located in a very short distance to the pipeline axis (Option 2) (in fact, the axis is so far designed to run parallel to the border of this reserve). This implies the permanent removal of trees in case the detailed design does not predict a distance of over 25 meters from the axis to the landscape reserve. This reserve is also a core area as per the NEN. In this core area, a “high” number of reptiles and amphibians exist, with a significant number included in a NEN operational checklist.

Within the project area, a **ecological corridor** is crossed that runs between the core areas Plaiul Fagului and Codrii (Map 3 in Annex 16.7).

Within the Plaiul Fagului Reserve and NEN core area, a “very high” number of mammals and a “high” number of insects and higher trees have been identified (Map 1 in Annex 16.7). From these, a “very high” number of mammals is protected by the Bern Convention, a “high” number of insects is included in the IUCN Red List and a “high” number of higher trees is considered threatened as per the Moldovan Law (Map 2 in Annex 16.7).

Within the Codrii Reserve and core area, also a “very high” number of mammals and a “high” number of insects and higher trees have been identified (Map 1 in Annex 16.7). From these, a “very high” number of mammals is protected by the Bern Convention, and a “high” number of higher trees is considered threatened as per the Moldovan Law (Map 2 in Annex 16.7).

According to Map 3 in Annex 16.7, the points where the routing options cross the ecological corridor are non-forested. This means that after construction the surface of the affected corridor area will return to its original state.

### 7.2.3 Other flora and fauna

The country’s flora is composed of 5,513 plant species, of which 1,989 are vascular plants and 3,524 are non-vascular plants (Teleuță, A., 2010). The fauna of Moldova comprises 14,800 animal species, of which 461 are vertebrate species and 14,339 are invertebrate species (MoEn, 2005).

Several natural ecosystems can be found in Moldova: forest, steppe, meadow, aquatic and paludal ecosystems (MoEn, 2005). According to the floristic composition forest ecosystems are the richest, followed by steppe ecosystems (Teleuță, A., 2010). From these, the forest ecosystems have the largest expression in the project area.

Within the forestry framework, 28 types of ecosystems are identified that include the following main types of forests: oak forests, sessile oak forests, pubescent oak forests, beech forests, parks, and a large variety of acacia parks.

Forests are composed mainly of deciduous species (97,8%), including *cvercinee* (oaks) – 143,8 thousand ha (39,6%), ash parks – 16,6 thousand ha (4,6%), carpinets – 9,4 thousand ha (2,6%), acacia parka – 131,0 thousand ha (36,1%), poplars – 5,7 thousand ha (1,6%) etc., resins being present just in a 2,2% proportion. The flora composition of forestry ecosystems includes more than 1,000 species of spontaneous vascular plants.

The floristic diversity determines to a large extent the fauna diversity in forest ecosystems. Forests still maintain a satisfactory environmental capacity for many animal species. There are about 172 species (or 47.8% of the total number of terrestrial vertebrates of the republic) in the forest ecosystems. From these, there are 47 species of mammals (64.4%), birds – 106 (37.9%), reptiles – 9 (64.3%) and amphibians– 10 species.

The project area crosses the forest ecosystems of Central Codrii, which are richer in floristic diversity than the northern part, and have even richer fauna diversity due to the compact surfaces of the forests in the surroundings of Straseni and Orhei. However, anthropogenic activity in the forest during the breeding period (harvesting of medicinal plants, mushrooms, forest cutting) disturbs animals, just as the reduction of forage (gopher, small rodents) continue to negatively influence birds of day pray species as *Aquila clanga*, *Aquila pomarina*, *Hieraaetus pennatus*, *Falco cherrug*, etc. Some of them do not have their eyrie anymore in these areas (Teleuță, A., 2010; MoEn, 2005).

The forest areas crossed by the project can be consulted in Map 8 in Annex 16.7. According to Figure 7-23, these are mainly composed of oaks, especially pedunculate oak (scientific name: *Quercus robur*).





**Figure 7-23: Forestry vegetation of Moldova and location of the project area (Teleuță, A., 2010)**

In many forest plantations in Chisinau, Balti, and other communities the replacement of native species with invasive ones is taking place.

In the following, a brief characterization of the fauna and flora of each of the districts within the project area is made.

### **Ungheni**

- Fauna: Animals like fox, wild boar, wolf, deer, red deer, raccoon dog, hedgehog, badger, wild cat, hawk, stork, egret, partridges and others.
- Flora: 26.6% of the district's area is occupied by forests, characterized by oak, beech, hornbeam, maple, acacia, lime and other trees. There are also other plants like clover, fescue, mugwort or nettle.

### **Calarasi**

- The fauna is characterized by animals such as fox, wild cat, marten, rabbit, squirrel, deer, wild boar, wolf pigeon, jay finch, eagle woodpecker and others.
- Flora: 30.7% of the district's territory is occupied by forests, which are dominated by hornbeam, beech, ash, elm, oak, and lime.

### **Nisporeni**

- The fauna is typical to the one in European forests: foxes, deer, red deer, spotted deer, badger, wild boar, raccoon dog, wolf, wild cats, hawks, eagle stork and others.

- Flora: 34% of the district is forest with trees such as oaks, beech, hornbeam, english oak, linden, maple and locust. There are also wildflowers in the district like clover, knotweed, nettle, bellflower and fescue.

### **Straseni**

- Fauna is typically composed of mammals such as foxes, wild boar, deer hedgehogs, wild cats, red deer, wolves, ferrets and birds like hawks, crows, storks, eagles and others.
- Flora: 36.6 % of the district is covered by forest. Typical trees are oak, english oak, beech, hornbeam, maple, ash and lime.

### **Chisinau**

- Fauna: on the territory of Chisinau were recorded 27 species of mammals, 89 species of birds and 14 species of reptiles and amphibians, such as: moles, hedgehogs, field mice, bats, various rodents, squirrels, weasels, polecats, martens, nesting and migratory birds, lizards, snakes, frogs, river frogs, turtles, toads, 20 species of fish (*Mediul Ambient*, 2008).
- The flora consists of about 220 species and 55 varieties of deciduous and coniferous trees, including 168 species of trees, 97 shrubs and 10 lianas. Știința, 2002. Existing protected trees are: beech (*Fagus sylvatica*), ash (*Fraxinus excelsior*), field maple (*Acer platanoides*), pear (*Pyrus pyraeaster*), gray poplar (*Populus canescens*), oak (*Quercus robur*), silver linden (*Tilia tomentosa*), volniș (*Ulmus levis*) (*Mediul Ambient*, 2011).

## **7.2.4 State of and threats to biodiversity in Moldova**

The biodiversity of Moldova has been severely reduced over the past 100 years. The forest cover in the country is the lowest for any country in Europe (UNECE, 2014). The current area of forests and other types of forest vegetation is insufficient to maintain the ecological balance of the environment. The gap between the current forest area of about 11% and the optimal level of this indicator (25-30%) explains the ecological imbalance which the Republic of Moldova is facing (Teleuță, A., 2010).

The lack of viable habitats of significant size is certainly the most significant threat to biodiversity of each of the country's ecosystems. Other threats have been identified as follows:

- non-observance of ecological legislation by the economic agents and population, and imperfection of the existing legislative and normative framework;
- unsatisfactory integration of biodiversity conservation requirements into economic and sectoral policies;

- intensive land use, in particular in steppe ecosystems, causing erosion and landslides, conversion of steppe, soil salinization and drainage of wetlands.
- invasive species, which damage crops and trees.
- pollution of natural habitats;
- intense exploitation of vegetal and fauna resources;
- significant reduction of budgetary allocations for the reproduction and regeneration of flora and fauna;
- the population is poorly educated in ecological matters (UNECE, 2014; MoEn, 2005b).

Some positive developments have however been registered in the past years:

- A steady development of organic agriculture is leading to the creation of favourable conditions for biodiversity conservation.
- Since 2005, wetlands have received significant attention, through the designation of three wetlands of international importance – Ramsar sites. This has offered the chance for increased species and habitat conservation measures.
- Between 2007 and 2010 the Agency “Moldsilva” undertook several activities to restore or establish forest/wooded lands. Activities for forest regeneration (reforestation of trees) on the National Forest Lands (NFL) took place on about 3,500 ha. Additionally some 20,000 ha of degraded sites, not previously forested, have been forested as an approach to combat desertification and erosion, as well as to provide alternative fuel wood sources. On some 10,000 ha of the NFL “natural regeneration” was supported (UNECE, 2014).

### **7.3 Human Environment**

In order to establish the human/socio-economic baseline environment in the project area, Fichtner’s sub-consultant Tehno Consulting & Design (TCD) conducted face-to-face interviews with 150 households in the project area. With this objective, TCD developed a questionnaire targeting issues such as land use, ownership, economical activities, and living conditions, among others. This questionnaire can be consulted in Annex 15.3.

In addition, data from the National Bureau of Statistics (2013) have been collected and analysed.

The following sub-sections present the main results of the human/socio-economic baseline assessment. Further tables containing statistical indicators can be found in Annex 16.3.

Land owners without a formal land title but with a valid claim to it are likely to be present in the project area. After the Soviet Union has been dismantled, the people received the land they have been working on.

However, due to reasons still not clear, some of these owners never received or applied for a formal land title. It is possible in Moldova for an informal owner with a legitim claim to the land to obtain a title. She or he shall for this purpose register their land. The register may take 3 to 6 months to be completed and needs to be ready for budgeting of the compensation costs of the project. If the register is successful, these land owners are entitled to compensation for land and assets.

Land owners without a formal land title *and* without a recognizable claim to it (squatters) are entitled, following the international requirements of the financing institutions, to receive compensation for any assets lost, with the exception of land. This could be the case of ethnic minority groups like the Roma. The socio-economic data for the project area point that 0,2% of the population in Nisporeni are Roma, followed by 0,5% in Calarasi and 0,07% in Chisinau.

The existence of these cases (land owners without a formal title but with a claim to it; landowners without a formal title and without a claim to it; Roma or other ethnic minorities) in the project affected area was not confirmed nor rejected during the socio-economic survey. During the detailed design and the survey of PAPs this shall be clarified, and compensation shall be paid in accordance.

### 7.3.1 Administrative organization

The Republic of Moldova is composed of 32 regions, 5 municipalities and 2 administrative-territorial areas (Gagauzia & the units on the left bank of the Dniester).

In the Republic of Moldova municipalities are urbanized areas which play a significant role in the nation's economic, socio-cultural, scientific, political and administrative life, with relevant industrial, commercial, health care and cultural facilities, as well as educational establishments.

In most cases municipalities are an agglomeration of several settlements. For example, the municipality of Chisinau, which is the capital city of the Republic of Moldova, comprises 35 settlements, which include 5 city districts, 6 towns and 12 communities (MoEn, 2009).

The proposed pipeline route starts in the Ungheni district, in the western part of Moldova, and ends in Chisinau Municipality, located in the central part of the country. The two route options under study cross in addition the districts of Nisporeni, Calarasi and Straseni.

Table 7-8 briefly describes the main administrative characteristics of each district/municipality.

**Table 7-8: Administrative districts/municipality of the project area**

District/ Municipality	Area [km <sup>2</sup> ]	Population (2013)	Population density [people/km <sup>2</sup> ]	Towns/ villages
Ungheni	1,083	117,400	108.4	74
Nisporeni	630	71,555	106.0	39
Calarasi	753	78,482	104.6	54
Straseni	730	91,744	125.1	39
Chisinau Mun.	563.3	799,741	1,375	34

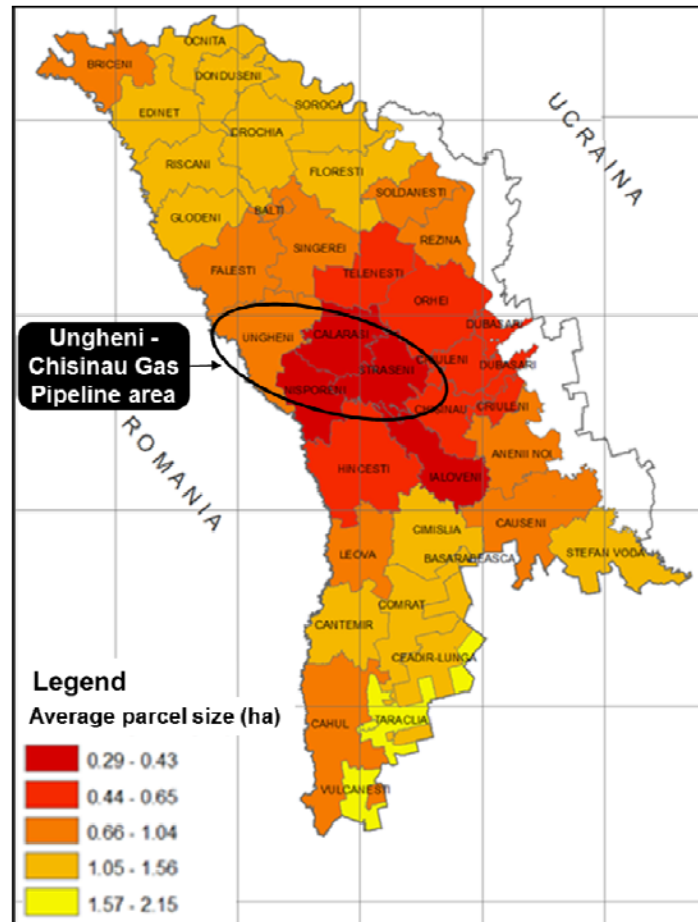
*Source: National Bureau of Statistics, 2013*

The two route options cross through and pass nearby urban and rural settlements. The routes have been selected and optimized with the intent to avoid human settlements due to potential resettlement issues.

### 7.3.2 General economic conditions

Due to a favorable climate and a fertile ground, Moldova's main products are fruits, vegetables, wine and tobacco. With a gross domestic product (GDP) per capita of \$ 4,200, Moldova imports oil, coal and natural gas, mainly from Russia. Moldova's economy is directly dependent on the economies of the neighboring countries Romania, Ukraine and Russia. The agricultural sector plays an important role in the national economy, contributing to more than 12% of the GDP. Agricultural production and processing generates approximately 50% of the revenues received from export.

Over 40.7% of the total area of land is owned by 390,380 individual agricultural producers. This high number of agricultural producers resulted from the privatization process that occurred in the 1990s after the breakdown of the USSR. After privatization of the former soviet collective farms, almost each household in rural areas received a share of agricultural land. This division resulted in high fragmentation of the agricultural lands with plots of sizes varying in average between 0.3 and 2.1 hectares (Figure 7-24).



**Figure 7-24: Average agricultural parcel size in Moldova (Government of Moldova, 2011)**

Currently, about 94% of the agricultural land in Moldova is privately owned (Government of Moldova, 2011). The high land fragmentation is considered to impede economic development.

As observed in Figure 7-24, the Ungheni - Chisinau Gas Pipeline is planned to be built in some of the most fragmented agricultural areas in Moldova.

The high number of agricultural plots and land owners implies considerable effort to assess the compensation for losses of land, agricultural assets and income due to the construction works.

The central part of Moldova has an economy based largely on agriculture, industry and tourism. The socio-economic data is presented in details in the Annex 15.4.

In the project area, agriculture is the dominant occupation among the habitants (30% as primary and 30% as secondary economic activity). However, the role of the government services is also significant (35% as primary and 18% as secondary source of income).

### 7.3.3 District profiles

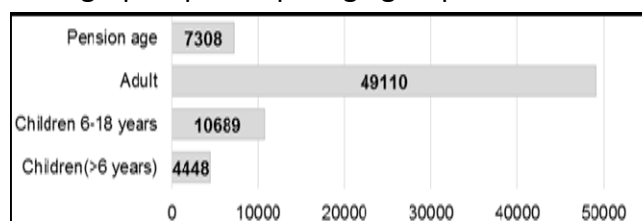
The following boxes depict a general description of some socio-economic characteristics of each of the districts within the project area.



## NISPORENI



### Demographic profile per age group



Source: National Bureau of Statistics, 2013

### List of localities affected:

Bratuleni, Bacseni, Chilisoaia, Bolduresti, Varzaresti, Nisporeni, Sendreni

**Nisporeni** is a district in the west – central part of Moldova, with its administrative center at Nisporeni city.

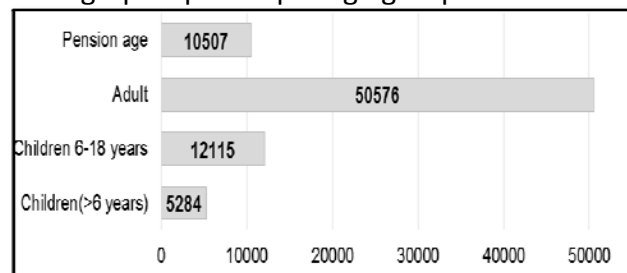
Agricultural land comprises 38,779 hectares, 61.5% of the total land's area. Agricultural land actually used represents 21,736 hectares (34.5% of the total land's area), where orchards cover 3,943 hectares (6.3%), vineyards cover 6,118 hectares (9.7%) and pasture covers 6,838 hectares (10.8%).

An increased amount of remittances (European Union, Russian Federation) led to the launch of new businesses and a diversification of the economic activities. In the city, three construction companies and a small furniture factory were created. The town has approximately 100 small shops which also contribute through taxes to the accumulation of district budget.

## CALARASI



### Demographic profile per age group



Source: National Bureau of Statistics, 2013

### List of localities affected:

Valcinet, Peticeni, Tuzara, Niscani, Sadova, Pitusca, Temeleuti, Selistea Noua, Novaci, Calarasi

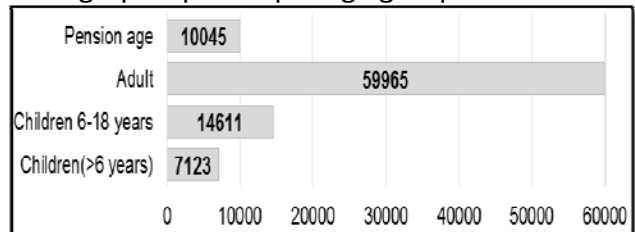
**Calarasi** is a district located in the central part of Moldova, with the administrative center at Calarasi town. The total area of the Calarasi district is 753.5 km<sup>2</sup>, where agricultural land represents 23,480 ha, forests 23,138 ha, and pastures 7,922 ha.



## STRASENI



### Demographic profile per age group



Source: National Bureau of Statistics, 2013

### List of localities affected:

Dolna, Micleuseni, Lozova, Vorniceni, Bucovat, Capriana, and Strasen.

**Strasen** is an administrative district situated in the central part of Moldova. Its administrative center and leading city is Strasen.

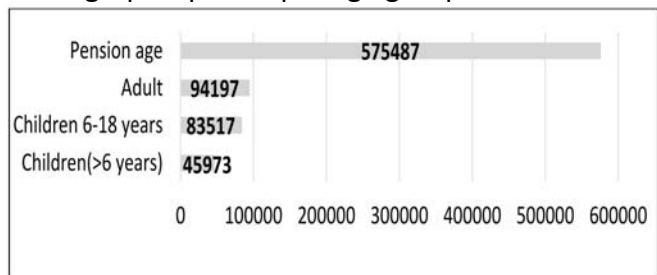
There are approximately 2,780 companies registered in Strasen. Most of the legal entities are registered as farms, reaching a number of 1,590.

Strasen enjoys a rich spectrum of grape varieties like Aligote, Pinot, Cabernet, Izabelle and Riesling. The industrial city is located in the northwest region of the city and is separated from the residential sector by railway.

## CHISINAU



### Demographic profile per age group



Source: National Bureau of Statistics, 2013

### List of localities affected:

Ghidighici, Gratiesti, Stauceni, Cheltutorii, Tohatin and Chisinau

**Chisinau** is an administrative district situated in the central part of Moldova. It is the administrative, economic and capital of Moldova.

Chisinau is the largest and most developed city of the country, where approximately 55,800 companies are registered.

### 7.3.4 Ethnic composition

The population in the districts that the project will cross is mainly composed of Moldovans, followed by Ukrainians, Russians, Bulgarians, Roma and Gagauz (Table 7-9). The exact ethnic composition of the project affected people will be determined during the detailed survey of PAPs to be undertaken during the detailed design phase.

**Table 7-9: Ethnic composition of the project area [%]**

<b>Ethnicity</b>	<b>Ungheni</b>	<b>Nisporeni</b>	<b>Calarasi</b>	<b>Straseni</b>	<b>Chisinau</b>
Moldovan	89.94	97.52	94.14	96.92	72.11
Ukrainian	7	0.68	3.73	1.11	8.28
Russian	2.5	1.5	1.26	1.77	13.92
Bulgarian	0.08	0.1	0.06	0.12	1.24
Roma		0.2	0.5		0.07
Gagauz				0.08	0.91

*Source: National Bureau of Statistics, 2013*

### 7.3.5 Level of education

Table 7-10 shows the level of education in the project area. According to the data from the National Bureau of Statistics (2013), the majority of the population has attended at least primary and secondary school. A smaller number has completed a university degree and attended vocational courses.

**Table 7-10: Level of education in the project area [%]**

<b>Level of education</b>	<b>Ungheni</b>	<b>Nisporeni</b>	<b>Calarasi</b>	<b>Straseni</b>	<b>Chisinau</b>
University	--	19	13	15	30,75
Vocational	--	5	2	4	30,37
Primary and secondary school	82	56.5	70	60	27,07
Pre-school	--	19	14	15	11,79

*Source: National Bureau of Statistics, 2013*

### 7.3.6 Agriculture

The present agriculture system practiced in the Republic of Moldova can be characterized as extensive and poorly organized. This is detrimental both to agriculture production and the status of soils and other natural resources (MoEn, 2005).

A large portion of the project's area is cultivated agricultural land. A summary of the major ephemeral crops here cultivated is provided in Table 7-11. The data show that cereals and leguminous crops are the predominant crops in the project area.

**Table 7-11: Major ephemeral crops in the districts crossed by the project [tonnes]**

<b>Ephemeral crop</b>	<b>Ungheni</b>	<b>Nisporeni</b>	<b>Calarasi</b>	<b>Straseni</b>	<b>Mun. Chisinau</b>
Cereals and leguminous crops	6,345	369	271	505	769
Sunflower	2,408	82	47	70	290
Field vegetables	741	5	74	415	1

*Source: National Bureau of Statistics, 2013*

Besides ephemeral crops, perennial agricultural plants are cultivated in the area, namely orchards and vineyards. Maps 5 and 8 in Annex 15.7 show the ephemeral agricultural fields, orchards and vineyards plantations in the project area.

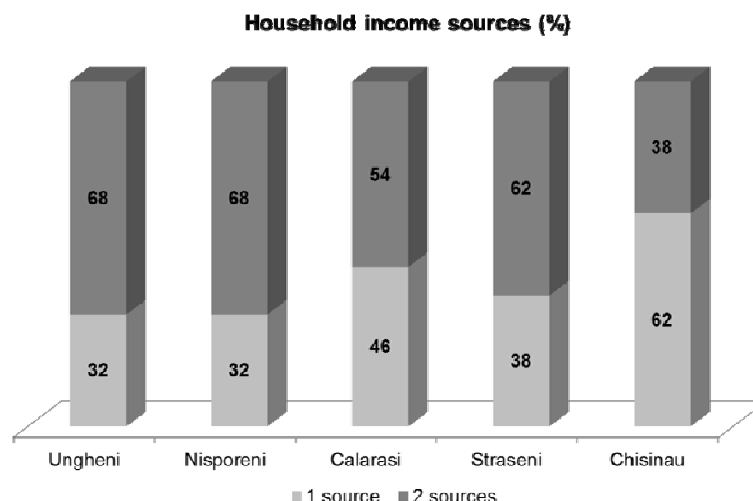
Understanding the cropping pattern is essential for the determination of the compensation for the loss of income due to construction works. The assessment of impacts in the present ESIA includes a calculation of each of the areas of different agricultural crops is expected to be affected, as well as the costs for compensation associated in Section 8.1.3.

### 7.3.7 Income and expenditure

Moldova is considered one of the poorest countries in Europe and more than 25% of the population lives below the poverty line (The World Bank, 2010). According to the International Fund for Agricultural Development (IFAD) about 42 percent of the rural population of Moldova is affected by poverty (Teleuță, A., 2013).

Agriculture is the main economical sector in the project area. Almost 40% of the households depend on this source for livelihood. Jobs in the governmental sector constitute 20% of the households' primary source of income. The third source of income with a considerable share of 40% is seasonal employment.

The data gathered from the National Bureau of Statistics (2013) show that in all districts there is a significant percentage of the population which has a second income source, especially in Nisporeni, Ungheni and Straseni.

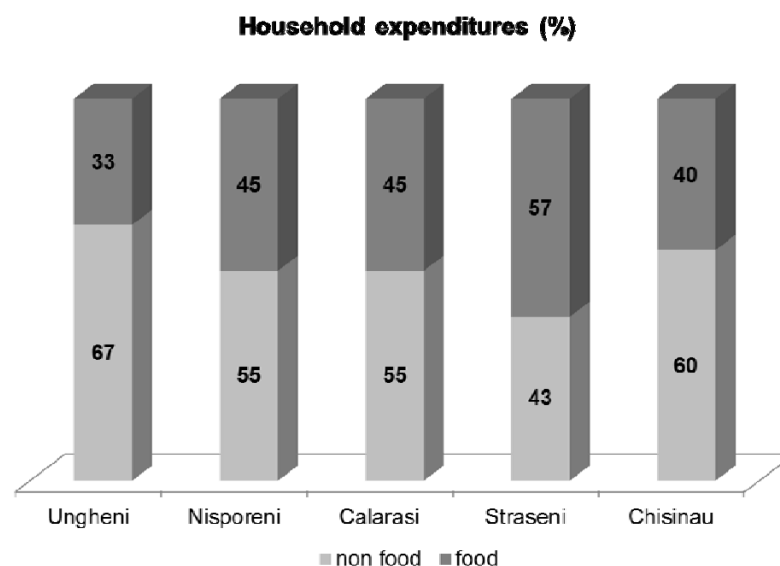


**Figure 7-25: Household income sources (%)**

*Source: National Bureau of Statistics, 2013*

The average annual income from single sources varies from MDL 2,165 to MDL 4,147 in the project area. Due to this generally low income obtained from one single source (agriculture, public or private sector), the population is forced to establish a second source of income in order to cover the daily expenditures.

For the purpose of this study, household expenditures were assessed for food and non-food products (Figure 7-26). For all districts except Straseni, most household expenditures incur for non – food products.



**Figure 7-26: Household expenditures (%)**

*Source: National Bureau of Statistics, 2013*

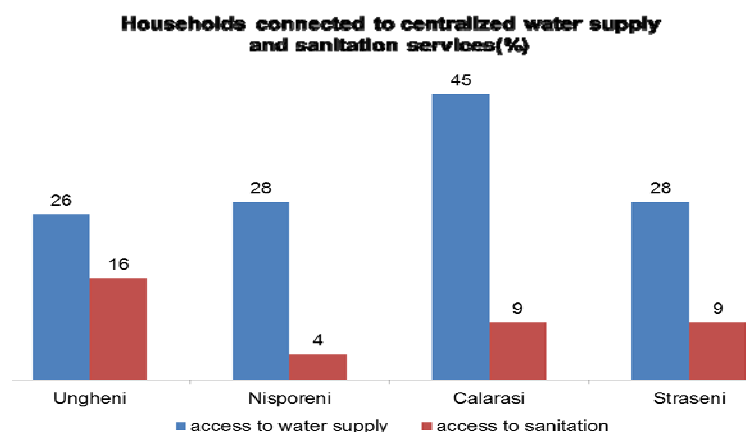
The data shown in this and the previous section can help understanding the link between agriculture production, income and food expenditures. For the households with agriculture as single income source, disturbance of

agricultural land during construction has a higher impact. For the households with more than one source of income, the impact of the project may not be that severe. A survey of each of the Project Affected Persons (PAPs) is necessary as soon as the detailed design of the pipeline routing is finalized in order to point and assess such cases.

### 7.3.8 Water and sanitation

The main sources of drinking water are water wells located within the administrative area of the localities. Most of the households residing in urban areas are connected to the central water supply system, while rural localities are not. In these areas, the primary water sources are rudimentary dug wells.

Overall in the project area, the access to centralized water supply and sanitation services is below 50%. Calarasi district has the highest rate of access to water supply in the project area (about 45% of people have access to water with only 9% access to sanitation). In the districts in the project area, the range of access to water is from 26 to 45% and the range of access to sanitation is between 4 and 16% (Figure 7-27). In Chisinau Municipality water supply and sanitation services cover the area almost entirely.



**Figure 7-27: Access to water supply and sanitation services (%) (Pienaru, A., et al, 2014)**

Potential impacts on the water utilities could be felt during the construction phase in case there is no coordination between the contractor and the provider of the water services. Please refer to Section 8.1.3.3 for the assessment of impacts on this component.

### 7.3.9 Access to electricity

Currently all vilages in all project districts have 100% access to power.

Potential impacts on the power utilities could be felt during the construction phase in case there is no coordination between the contractor and the electricity provider. Please refer to Section 8.1.3.3 for the assessment of impacts on this component.

### 7.3.10 Tourism

At present tourism accounts for a relatively insignificant portion in the national economy. The modest infrastructure in the tourism and low incomes generated by the tourist businesses rates the Republic of Moldova among the countries where tourism is developed poorly.

The Strategy of Sustainable Development of Tourism in the Republic of Moldova for the years 2003-2015 identifies, among the priorities of the tourism sector, the development of several specific domains. One of them is based on the long-lasting tradition of Moldovans in wine-making, with the view to make this a tourist attraction.

The country has also a good potential for developing the spa tourism. The watering places based on rich mineral waters' resources could become a tourism product of international level on the condition that an adequate infrastructure is created (MoEn, 2005).

In addition, the interest for eco-tourism is increasing in Moldova, as the number of visitors of Natural Protected Areas has increased from 6,266 in 2008 to 9,020 in 2010 (Teleuță, A., 2013).

### 7.3.11 Significant cultural, religious and historical sites

About 15,000 historical and cultural monuments have been identified so far in the Republic of Moldova dating from different historical époques. Out of those, 5,698 sites are included in the official Register of monuments under state protection, including 891 ecclesiastic buildings, two medieval fortresses (Tighina and Soroca), 17 castles and parks, about 700 urban architectural monuments, and a large number of archeological sites, some of them of international significance (MoEn, 2005).

After consultation with local authorities and a site visit, a list of cultural, religious and historical sites in the project area has been obtained (Annex 15.5). The exact location of these sites is not yet known. This shall be subject of a survey to be undertaken before the construction works begin (see Section 8.1.3.7). Figure 16-2 to Figure 16-7 in Annex 16.4 show the approximate location of the sites.

## 8. Assessment and mitigation of impacts

The potential impacts on the natural environment and the socio-economic features of the project area are assessed in this Section throughout the **construction** and **operation/maintenance** phases. The previous stages of the ESIA process (inception scoping and scoping, as well as pre-feasibility) have considered the **design** phase by defining and optimizing the route in such a way to avoid environmental and socio-economic negative impacts to the extent possible. The results of this work have been described in Section 6.

Normally pipelines are not decommissioned. However, in case these area generally, the anticipated impacts throughout the **decommissioning** phase are similar in nature to some of the impacts assessed during the construction phase - limited to impacts on air quality, noise, soil and groundwater, agricultural soils, and community and occupational health and safety. Therefore, the assessment of impacts for those receptors during the construction phase is assumed to apply to this phase in particular without the need to reiterate or emphasize this throughout this Section.

Both options 1b and 2 have been studied in the previous stages of the ESIA/feasibility study process, but no conclusion could be withdrawn in relation to which would be the most feasible from a technical, financial, economical and environmental point of view. It has as therefore been determined that a more detailed assessment (preferably quantitatively) would be necessary to precisely determine the differences between both options and make a sustained decision on which to choose.

This Section presents the results of the impact assessment for Option 1b and Option 2 in a **comparative way**. The objective is to determine which option shall be further considered for the project.

The assessment of impacts is necessarily based on the current available technical information and understanding of the project (as detailed in Section 3), some of which might have to be updated and/or subject to change at a later stage (i.e., during the detailed design phase, appointment of the EPC Contractor, etc).

For the assessment/classification of the project impacts, an evaluation matrix based on different factors is used to allow a transparent and complete evaluation procedure. The variables are:

- Scale: Local, Regional, National or International;
- Duration: Permanent or Temporary (Short, Medium or Long Term);
- Severity: Low, Medium or High;
- Certainty: Possible, Likely, Highly Likely or Definite;
- Direction: Positive (beneficial) or Negative (adverse);
- Direct or Indirect;

- Cumulative or not (an impact can be considered cumulative if the site is presently or will in the future (based on present knowledge) be affected by the same factor (e.g., water pollution)).

To classify the impact it is in addition identified the need for further investigations e.g. in form of a separate specialist study. These investigations may need to be undertaken by the Construction Contractor or Governmental Authorities during the detailed design phase or immediately before construction.

Considering the above listed factors, the significance of the impact can be finally determined:

- Significance: Nil or Negligible, Low, Medium, High or Very High.

The assessment of impacts includes as well the determination of mitigation and compensation measures to eliminate or reduce the impacts to the minimum possible. In case mitigation or compensation measures are applicable, the residual impacts are then classified.

The following maps can be found in Annex 16.7 and serve as a support to this Section:

- Map No. 1: Major Biodiversity Values - National Ecological Network of the Republic of Moldova
- Map No. 2: Target Species - National Ecological Network of the Republic of Moldova
- Map No. 3: Ecological Corridors - National Ecological Network of the Republic of Moldova
- Map No. 4: Eroded areas and landslides in the project area and expected areas of impact (erosion enhancement)
- Map No. 5: Agricultural areas in the project area, and expected areas of impact (loss of productivity)
- Map No. 6: Surface water in the project area, and expected areas of impact (crossing, contamination and over usage)
- Map No. 7: Residential areas in the project area, and expected areas of impact (air and noise emissions)
- Map No. 8: Protected and other green areas in the project area, and expected areas of impact (landscape and biological environment)



## 8.1 Impacts and measures during the construction phase

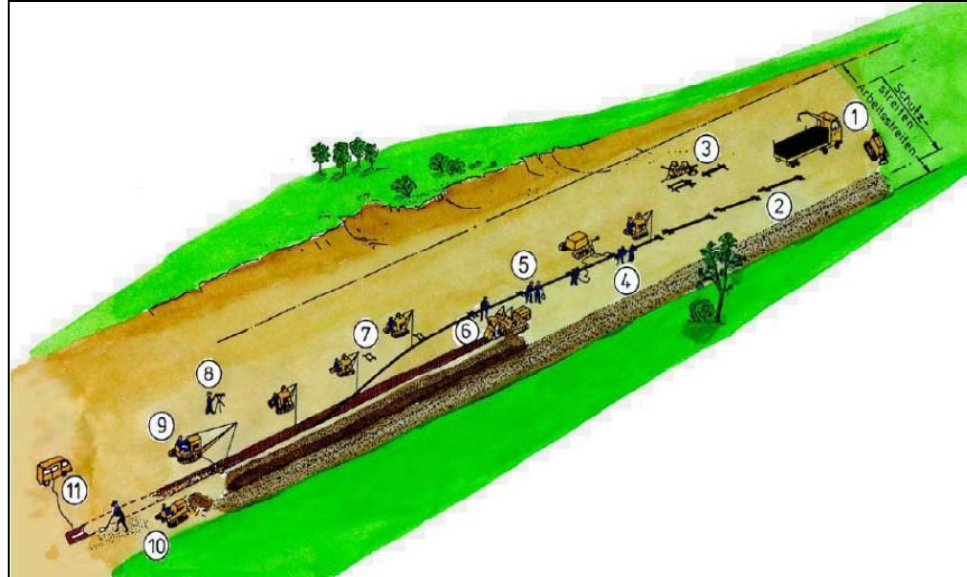
For the project it is considered that the construction activities imply a strip with a width of 16 meters where opening of trenches and deposition of some materials is made, and construction vehicles circulate: **construction strip**. On the construction strip the soil will be cleared of all vegetation and the topsoil will be removed. This implies that vegetables, cereals, orchards, vineyards, pastures, and forest trees will be affected. Ephemeral agricultural crops and pastures will be affected only during construction, but forest trees, orchards and vineyards will not be re-planted. Construction vehicles and machinery will not be allowed outside the designated areas within the construction strip.

To allow the operation of the pipeline, a 50 meters wide **safety strip** or Right of Way (ROW) will be necessary. Above the safety strip, all forest trees, orchards and vineyards need to be cleared (this will be done during the construction phase).

The associated activities related to the construction of a pipeline have been described in Sections 3.3 and 3.5. These activities are listed and generally described below and in Figure 8-1.

- Clearing of the construction area (1): removal of the vegetation and the topsoil cover in the construction strip (expected to have a width of 16 meters for the project); stockpiling of the topsoil separately; removal of the vegetation from the safety strip (expected to have a width of 50 meters for the project).
- Pipe hauling (2): transportation of the pipe components along the cleared strip.
- Pipe bending (3): whenever necessary, some pipes are bended using appropriate machinery.
- Stringing (4): binding the pipe components along the trench; the pipes are lined up end to end to allow welding into strings.
- Welding and Inspection (4, 5): welding the pipe components to each other; each weld undergoes nondestructive testing, and the coating is inspected.
- Trenching (6): excavation is performed with backhoes or trenching machines to excavate a pipeline trench.
- Lowering (7): the pipe is placed inside the trench using a side boom tractor.
- Pipeline location survey (8): survey of the location of the pipeline.
- Hydro testing (11): pressure testing with water to verify the pipeline's integrity.
- Backfilling (9): backfill follows shortly after lowering the pipe; fine grade material, free from sharp edged stones, should be used and carefully compacted around the pipe to cover it.
- Construction area reinstatement (10): replace the topsoil under the guidelines defined later in this ESIA (under Section 8.1.1.1 and the

ESMP). and replant the original vegetation taking into account the safety restriction (ex.: no trees and vineyards can be reinstated, but other type of agricultural crops and pasture vegetation can be re-cultivated in the safety strip).



**Figure 8-1: Construction of a pipeline**

The activities with higher potential for environmental and social impacts are clearing (1) and trenching (6), due to the associated earth movements, movements of heavy machinery, losses of crops and trees, and noise and air emissions. The potential for impacts on the community and occupational health & safety are also higher in these phases.

It shall be noted that in the initial stages of the ESIA a selection and further refinement of the pipeline routing options has been made with the intent to avoid, or at least, minimize the impacts on the environmental and social features of the project area. This has been made to the maximum extent which is technically and economically possible (Section 6) and considered most essential issues such as:

- keeping distance to lakes, rivers and villages;
- shortening the pipe's length;
- avoiding eroded areas and areas prone to erosion;
- avoiding to place the pipeline in perennial plantations, forests and valuable habitats.

Considering the width of the construction strip (16 meters) and the length of each option, the area of land which will be temporarily necessary for the construction activities is shown in Table 8-1.

**Table 8-1: Area of land temporarily necessary for construction of the pipeline**

Option	Length [km]	Area of land temporarily necessary for construction (16 meters width constr. strip) [ha]
1b	119.95	192
2	133.21	213

The stripped top soil and excavated sub soil quantities are estimated as shown in Table 8-2 and Table 8-3.

**Table 8-2: Estimative of the volume of top soil to be stripped for the project**

Top soil depth	Construction strip width	Volume of stripped top soil	
0.2 m	16 m	3,200 m <sup>3</sup> /km	
		<b>Option 1b</b>	<b>Option 2</b>
		ca. 384,000 m <sup>3</sup>	ca. 426,000 m <sup>3</sup>

**Table 8-3: Estimative of the volume of sub soil to be excavated for the project**

Trench depth	Lower trench width	Upper trench width	Volume of excavated sub soil	
1.5 m	1 m	2.73 m	2,700 m <sup>3</sup> /km	
			<b>Option 1b</b>	<b>Option 2</b>
			ca. 324,000 m <sup>3</sup>	ca. 360,000 m <sup>3</sup>

A construction time of 24 months is predicted for the Ungheni-Chisinau pipeline, including the pressure regulation stations, under optimistic conditions and good construction performance.

Since the construction of a pipeline is a linear work, the project area will be affected only locally and temporarily in its different sections (a few weeks per section). For this reason, no section will be affected for the entire duration of the construction period, which significantly reduces the negative impacts of this phase.

Some temporary access roads might be necessary during the construction period, but not enough information is available at the present stage to determine their location. The impacts of any needed access roads are assessed in general terms in this ESIA.

The construction of associated infrastructure (GPRS, pigging stations and block valve stations) is in addition considered in the assessment.

It is estimated that around 50 workers will be necessary in total for the construction of the pipeline, meaning that small workers camps shall be needed. The number and location of workers camps shall be defined by the construction contractor once manpower and logistics planning is completed.

For the ESIA, it is estimated that 2 camps will be necessary for the whole extension of the pipeline, one every 60 kms. The requirements for the location and management of the workers camps to be followed by the construction contractor are described in Section 10 and throughout this Section.

It is estimated that 4 laydown yards will be necessary along the pipeline construction site. Each of these yards shall have 1,000 m<sup>2</sup> or 0,1 ha.

The measures proposed in this Section shall be considered within a comprehensive **Health, Safety and Environment Plan (HSE Plan)** to be developed by the contractor before the construction phase begins.

The HSE plan has to be applied by the contractor in the construction phase and supervised by the MoE (Project Owner), responsible governmental authorities (environment, health, workers rights and culture) and the financers. More details on these procedures can be consulted in Section 10.

It is advised that the Project Owner prepares a linear diagram of the entire pipeline route to allow the contractors to easily identify all risk areas described in this ESIA.

## 8.1.1 Impacts on the Physical Environment

### 8.1.1.1 Soil degradation

Soil erosion (a), mixing (b), rutting (c), and compaction (d) are impacts commonly associated with construction activities that can greatly affect the soil quality and especially future crop yields (productivity). Disturbance of the natural soil structure can also severely impair the habitat value, especially of meager soils with a rich variety of animal and plants species. In those areas mechanical soil disturbance usually leads to a sharp decline in the number of species.

#### *a) Erosion*

Temporary access roads and construction sites in steeper areas (areas prone to landslides, for example) will lead to permanent destruction of the soil and an increased risk of subsequent erosion effects. In addition, the digging of trenches for the pipelines and the removal of vegetation at the construction strip are likely to affect the soil structure and weaken its resistance, causing possible erosion effects, especially in areas where erosion is presently felt.

Other impact sources are the drainage of water off the construction strip and the cut and fill activities.

For the project area, high risks of soil erosion have been identified by the national climate change adaptation strategy (MoEn, 2012), which made a vulnerability assessment of the magnitude of the risks of the climate change on agricultural production in the Moldova (Section 7.1.5).

Several eroded areas have been avoided in the planning stage (please refer to Section 6), but some are still present in the project area. The specific sites where erosion effects may be felt during construction of the pipeline are shown in Map 4 in Annex 16.7 for both options.

By considering a construction strip with a width of 16 meters, it has been determined which of the routes implies a larger impact area in eroded land. The results can be consulted in Table 8-4.

**Table 8-4: Impacts on the physical environment - erosion - affected area**

Option	Area of eroded land affected by construction [ha]				
	Heavy erosion	Moderate erosion	Low erosion	Landslides	TOTAL
1b	2.33	23.36	25.63	0.12	51.44
2	1.08	16.99	39.70	0.01	57.78

The area of affected eroded land/landslides constitutes ca. 27% of the total construction area for both options (the total construction area is shown in Table 8-1). This implies that for both options this impact has an important spatial extent.

The results from Table 8-4 show that heavily eroded areas represent 1% of the whole construction area for Option 1 and 0.5% for Option 2; moderately eroded areas represent 12% of the whole construction area for Option 1 and 8% for Option 2; low eroded areas represent 13% of the whole construction area for Option 1 and 19% for Option 2; landslide areas represent insignificant fractions of the whole construction area for both options.

In summary, Option 2 would affect some more eroded land than Option 1b. However, Option 1b affects a larger area of heavily and moderately eroded land, as well as of landslides.

*b) Mixing; c) Rutting; d) Compaction*

During excavation of the trenches, there is a risk for **mixing** topsoil with subsoil, which may lead to changes in the concentration of nitrogen, phosphorus and potassium ions in the soil, as well as to losses of organic material, mulch, seed banks, enzymes and bacteria. Since most of the soil nutrients available to plants occur in the top soil layer of agricultural areas, the loss or mixing of this layer can lead to an important reduction in the soil's fertility (IROWA, 1985).

Significant **rutting** can occur when heavy vehicles and machinery circulate on saturated soils or wetlands (Figure 8-2). The project crosses two wetlands or lakes, as described in Section 7.1.8. One wetland is crossed by both options and the other only by Option 2. Rutting risks exist also if works

are undertaken in agricultural land with a high clay content during a wet period. Rutting compacts a large amount of soil into a very small space, eliminating available pore space for rooting, water and nutrient flow. The rutted area becomes too wet for plantations and the surrounding areas are robbed from moisture they would otherwise receive.



**Figure 8-2: Rutting occurring in a wet soil after passage of vehicles (URL 11)**

The circulation of construction machinery can lead in addition to **compaction** of the soils, which causes increased soil density and reduced permeability, leading to problems such as ponding of water, decreased root penetration and reduced aeration of the soil. The soil moisture has a great influence on the soil compactibility, which has the optimum conditions to occur when the soil moisture is at or near field capacity<sup>1</sup> (IROWA, 1985).

The pipeline is planned to cross several agricultural areas, where negative effects in the soil productivity due to mixing, rutting and compaction may be felt for both options. Map 5 showing the agricultural areas crossed can be consulted in Annex 16.7.

For the project area, high risks of soil salinisation and desertification have been identified by the national climate change adaptation strategy (MoEn, 2012), which makes a vulnerability assessment of the magnitude of the risks of climate change on the agricultural production in the country. Medium risks for yield and crop quality decrease have been identified. This implies that the project may bring up cumulative soil productivity losses for the area, if not properly managed.

By considering a construction strip with a width of 16 meters, it has been determined which of the routes may imply a larger impact area in the agricultural land's productivity. The results can be consulted in Table 8-5.

---

<sup>1</sup> Field capacity = the percentage of water remaining in the soil 2 or 3 days after it has been saturated and free drainage has practically ceased (IROWA, 1985)

**Table 8-5: Impacts on the physical environment - mixing, rutting and compaction - affected area**

Option	Area of ephemeral agricultural land affected by construction [ha]
1b	116.04
2	144.3

The results show that Option 2 implies a larger area of affected ephemeral agricultural land when compared to Option 1b. When compared to the results of Table 8-1, these numbers show that most of the construction strip is composed of agricultural land (60% in Option 1b and 68% in Option 2), for what the impacts on this component are important. In addition, higher risks of rutting exist for Option 2 as in this case two wetlands would be crossed.

### **Mitigation**

Despite the existing data on erosion prone areas and landslides, a new Landslides and Erosion Survey in the project area shall be undertaken by the contractor.

The Landslides and Erosion Survey shall be undertaken during the detailed design phase and at least three months prior to any heavy machinery working in the RoW or in clearing activities. It will be of interest also to avoid crossing of potential dangerous areas where trenching may trigger a new landslide. This survey shall be undertaken in direct contact with the farmers and land owners, which may help pointing site-specific soil characteristics and flag any sensitive areas which may exist within the construction strip or within the areas defined for location of temporary or permanent structures. The pipeline route shall be deviated from and structures shall not be placed on landslides and severely eroded areas to the extent possible.

The construction contractor shall prepare a Soil Management and Erosion Control Plan as part of his HSE Plan.

A Soil Management and Erosion Control Plan will allow the contractor to depict all measures necessary to avoid causing/enhancing erosion effects and to avoid rutting, compaction and mixing of the soils. The plan shall include but is not limited to the following measures:

- In the case landslides cannot be avoided, the pipeline shall be installed beneath the failure plane.
- The amount of disturbance to the soils shall be minimized, i.e., all works shall be kept within the construction strip.
- On the sections where landslides and severe erosion exist (Map No. 4 in Annex 16.7 shows where these areas can be found within the project

area. The results of the Landslides and Erosion Survey will complement the data show in this map), the following shall be alternatively undertaken:

- Installation of slope drains providing a temporary outlet for runoff water (Figure 8-3 below);
  - Construction of temporary diversion channels to prevent the flow from damaging erodible or unstable areas;
  - erosion control structures (blankets, mats, geo-textiles) shall be implemented;
  - the slopes shall be track walked up and down to improve the stability of the soil.
- Specifically for **topsoil management**, examples of measures to be applied are:
    - Top soil stripping:
      - top soil shall be stripped from the entire construction strip, i.e., trench + spoil area + work area width.
    - Top soil preservation:
      - do not mix top and sub soils, i.e., stock the stripped top soil and the excavated subsoil in different piles;
      - if required (e.g., when the distance between piles is inferior to 1 m), a physical barrier (e.g., straw mulch) shall be used to assist in delineating the separation between the two piles;
      - all stripped topsoil must be securely stored during construction, and replaced to the surface of the construction strip. The topsoil can not be used for any other purpose or replaced to any depth greater than the original topsoil height (predicted to be ca. 20 cm);
      - the topsoil pile must not exceed 2 meters in height to prevent decomposition of the organic material into compost (IPLOCA, 2011).
      - handle all soil within the confines of the designated construction strip of 16 meters width, including the soil deposits;
      - all stripped topsoil must be replaced to the surface of the construction strip immediately following construction and backfilling. The topsoil must be spread evenly across the strip covering the original topsoil height (predicted to be ca. 20 cm).
      - Take measures required to prevent erosion (from wind and water) of the stockpiled soil. This may require the usage of plastic HDPE (high density polyethylene) covering, jute matting, water, mulch, or tackifiers to stabilize the topsoil where persistent high winds are eroding topsoil piles or removing topsoil from the construction strip.
  - To avoid **rutting and compaction**: if standing water or saturated soils are present, pause the construction activities. In alternative, the equipment and vehicles shall be operated on timber riprap or prefabricated equipment mats. In areas with soils sensitive for compacting (clay, silt - to be determined with support from the farmers) excavator support mats should be used for temporary access.



- **Soil reinstatement measures** shall be undertaken after backfilling of the trenches as follows:
  - in case compaction of the soils has occurred, mechanical decompactors or sub-soilders can be used to relieve compaction that has occurred in deeper soil layers (up to 60 cm from the surface) (IROWA, 1985). This activity shall also be carried out on all temporary traffic and storing areas, which are not needed after the end of the construction phase.
  - the ground shall be recountoured to match the topography of the area. This may imply filling up or smoothing of any ruts.
  - all stripped topsoil from the construction strip must be replaced to the surface of the construction strip immediately following backfilling. The topsoil must be spread evenly across the strip covering the original topsoil height (predicted to be ca. 20 cm).
  - temporary access roads shall be rehabilitated and replanted after construction;
  - vegetation with short roots like vegetables, cereals and pastures shall be replanted within the construction strip with the originally grown species;
  - in areas where originally forest trees, orchards and vineyards were present, the RoW shall be replanted with local short-rooted vegetation;
  - organic erosion control mats shall be installed in the areas of landslides and highly eroded areas shown in the Map No. 4 in Annex 15.7 to enhance reinstatement;
  - any evidence of erosion after reinstatement shall be mapped and considered for the final reinstatement. The need for additional erosion control measures shall be assessed.



**Figure 8-3: A slope drain (Mathews, J., 2006)**

### **Classification of impacts**

The classification of impacts on the soil due to erosion can be consulted in Table 8-6 for both options.

**Table 8-6: Classification of the impacts on the soil due to erosion - construction phase**

Impacts on soil due to erosion - Construction phase		
Factors	Option 1b	Option 2
Scale	Local	Local
Duration	Permanent	Permanent
Severity (comparative) *	High	Medium
Certainty	Highly Likely	Highly Likely
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	Yes	Yes
Specialist study?	Yes (Erosion and landslides survey before construction)	
Significance	High	Medium
Mitigation measures applicable?	Yes	
Compensation measures applicable	No	
Significance of the residual impacts	Medium	Low

\* The severity is assessed in a comparative way and depends on the area of affected significantly eroded land and landslides for each option

The classification of impacts on the soil productivity due to mixing, rutting and compaction can be consulted in Table 8-7.

**Table 8-7: Classification of the impacts on the soil due to mixing, rutting and compaction - construction phase**

Impacts on soil due to mixing, rutting and compaction - Construction phase		
Factors	Option 1b	Option 2
Scale	Local	Local
Duration	Temporary, may be long term	Temporary, may be long term
Severity (comparative) *	High	Very high
Certainty	Likely	Likely
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	Yes	Yes
Specialist study?	No	
Significance	Medium	High
Mitigation measures applicable?	Yes	
Compensation measures applicable	Yes	
Significance of the residual impacts	Low	Medium

\* The severity is assessed in a comparative way and depends on the area of affected ephemeral agricultural land for each option

### 8.1.1.2 Soil pollution by waste deposition

The construction activities will generate waste which has the potential to physically and chemically affect the soils of the project area. The national climate change adaptation strategy (MoEn, 2012) assessed that there are medium to high risks of degradation of the agricultural soil in the project area (salinisation, yield decrease, droughts, etc.) due to climate change. This implies a possibility for cumulative effects on soil due to the construction of the pipeline.

The main waste expected to be generated during construction of the proposed pipeline and above ground installations is as follows:

- soil and rocks from foundation activities for the associated infrastructures;
- excess subsoil or spoil from trenching: at least the volume occupied by the pipeline will be turned into excess spoil, i.e., 283 m<sup>3</sup>/km for the 600 mm pipeline. For the 119.95 km of Option 1b, this implies ca. 33,700 m<sup>3</sup> of spoil; for the 133.21 km Option 2, this implies ca. 37,600 m<sup>3</sup>. These are the minimum quantities of spoil expected. Because the subsoil is naturally compacted to some degree, and after trenching it loosens, it is assumed that more spoil volume will be generated than the volume equivalent to the space occupied by the pipeline.
- plant debris from clearance of the construction and safety strips, as well as the above ground facilities' areas;
- construction waste like unused / unusable construction material, wood from frameworks, maintenance waste, packaging material, empty containers, etc.;
- hazardous waste: fuel, engine oil, antifreeze, and lubricants;
- drums and containers (of hazardous and non-hazardous materials);
- domestic/households garbage like paper, plastic, drink containers, food waste, etc.: predicted as 1 kg/ person/day - from a total of ca. 50 workers on site, it is estimated that 50 kg/day of domestic waste will be generated.
- domestic waste water: predicted as 50 liters/person/day - from a total of ca. 50 workers on site, it is estimated that 2,500 liters/day of waste water will be generated.

In addition, cleaning pigs can be used to remove dirt or general construction debris that may have been left inside the pipe during construction, as well as to dewater and dry the pipeline before commissioning. The residues of these processes might entail a risk for the soil, if not identified and managed accordingly.

There are no specific landfills or treatment facilities for hazardous waste in Moldova.

#### **Mitigation**

In order to handle the waste in a proper manner during construction, the Construction Contractor shall develop a Waste Management Plan (WMP) as part of the HSE Plan for construction.

The following basic principles shall be considered in the WMP:

- a waste management hierarchy of avoidance, minimization, reuse, recycling, treatment and disposal;
- segregation of all waste based on their nature and ultimate disposal sites;
- good technical planning to minimize the generation of construction waste;
- staff training to increase awareness of waste management hierarchy and procedures, segregation, storage, and labeling issues;
- inspecting and auditing principles.

The following specific measures shall be considered:

- the construction waste shall be reused as much as possible on site;
- any construction debris generated shall be sorted by type, managed and ultimately disposed, reused or recycled in accordance to the WMP;
- portable toilets must be made available at all workers camps and along the entire RoW in order to avoid pollution with human excreta, and the waste water originated must be evacuated by specialized trucks and brought to water treatment facilities.

To handle the hazardous waste, the following shall be undertaken:

- Temporarily store the hazardous waste on separate locations on site with the following characteristics:
  - Labeled, enclosed and impermeable containers;
  - Basement made of impermeable plastic layers;
  - Safety sheets available in the containers.
- Agree with the provider of oils, antifreeze and other hazardous materials to take back the used empty drums after construction;
- Drain the oil filters to remove the excess oil;
- Deliver the used oil to companies which may be able to recycle it, either in Moldova or abroad.

The excess subsoil (spoil) could be handed over to land owners which are interested in reinforcing eroded areas on their lands. If this is not possible, or no demand exists, the Construction Contractor shall deposit excess soil at existing landfills after agreement with the regional authorities and approval by the lenders concerning the quantity and types of waste to be deposited. The available landfills on each district are:

- Ungheni: Ungheni and Cornesti landfills;
- Calarasi: Calarasi and Oniscani landfills;
- Nisporeni: Boltun, Iurcenii and Cristesti landfills;
- Straseni: Straseni and Romanesti landfills.

The soil waste generated in Chisinau cannot be transported to the existing landfill (in Tintareni), as this is presently closed. The Construction Contractor shall discuss with the authorities in Chisinau how to provide the soil waste a proper final destination. This will require approval by the lenders prior to use to ensure compliance with the project's standards. Any excess spoil management solutions need to be planned in detail at the design stage, as spoil management implies also truck traffic management and site restoration planning.

The recyclable waste generated on site shall be handed over to authorized agents. A list of these agents is available in Annex 16.5.

### **Classification of impacts**

The classification of impacts on the soil quality due to waste deposition can be consulted in Table 8-8 for both options.

**Table 8-8: Classification of the impacts on the soil due to waste deposition - construction phase**

<b>Impacts on soil due to waste deposition - Construction phase</b>		
<b>Factors</b>	<b>Option 1b</b>	<b>Option 2</b>
Scale	Local	Local
Duration	Temporary, may be long term	Temporary, may be long term
Severity (comparative) *	Low	Medium
Certainty	Possible	Possible
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	Yes	Yes
Specialist study?	No	
Significance	Low	Medium
Mitigation measures applicable?	Yes	
Compensation measures applicable	No	
Significance of the residual impacts	Low	Low

\* The severity is assessed in a comparative way and depends on the length of each option

#### **8.1.1.3 Water resources**

Several impacts may be expected on the surface and underground water resources from the construction of a pipeline. These may arise from:

- a) crossings of surface water;
- b) discharge and run-off of sewage, contaminated storm waters, sediments and other liquid materials and wastes;
- c) hydrotesting (sourcing of water and discharge of the effluent).

*a) Crossings of surface water*

Considering that the water features to be **crossed** by the pipeline are relatively small/narrow, or have low water levels, open cut techniques will be used for crossing.

In open-cut wet ditch crossing methods, there is no diversion of the stream, i.e., the pipe is installed and backfilled while the stream continues to flow. This can be done in small rivers or in larger rivers with little or no water at the time of crossing. It has the benefits of providing a low cost and quick solution. It has, however, the disadvantage of creating a potentially significant sediment runoff. This increases the total suspended sediments in the water and may cause changes in the channel's morphology and impact aquatic life (for example, by smothering eggs and cause abrasion on gills leading to mortality).

In open-cut dry ditch crossing methods, the stream is isolated and diverted. The isolation may be made by means e.g. of sand bags placed both upstream and downstream the crossing spot. Then the stream is diverted using a flume pipe or by transferring the water across the site by means of a temporary pipe and pump. Open-cut dry ditch methods are usually more expensive and time consuming than open-cut wet ditch methods. However, they cause less sediment yield and, as therefore, less impacts on the river's morphology and aquatic life.

Depending on the crossing technique selected, the levels of suspended solid sediments in the river's water may be raised (especially in the case of open cut wet ditch crossing), or the flow may be disrupted (in the case of open cut dry ditch crossing). Both bring up with consequences for the aquatic life, habitat and river's morphology. In addition, to cross surface water with the open cut technique, riparian vegetation will need to be removed.

The crossing of rivers and water basins has been avoided to the extent possible in the design phase (please refer to Sections 6.2 and 6.3). Despite these efforts, some surface water features will be crossed by the pipeline.

*b) Discharge and run-off*

Surface and ground water contamination might be caused by the incorrect **disposal** or **accidental run-off** of:

- Sewage from the temporary toilets and the workers camps;
- Fuel, and new and used engine oil and lubricants (maintenance of equipments and machinery);
- Waste water resulting from washing of vehicles and machinery;
- Sediments resulting from earth works.

*c) Hydrostatic testing*

Water contamination may also happen due to an inadequate disposal of the water used for the **hydrostatic testing** of the pipelines (Section 8.1, step 11). This water may contain corrosion inhibitors to prevent internal corrosion, as well as biocides. The Ungheni-Chisnau pipeline is planned to

include an internal coating layer to avoid corrosion, for what no anti-corrosion chemicals need to be added to the hydrotesting water. However, contaminants present in the recently installed pipe may be retained by the water during its passage through the pipes.

Water sourcing for hydrotesting may also adversely affect the water level or flow rate of the surface or underground natural water body chosen (IFC, 2007b). Hydrotesting will be done in pipeline sections with a maximum of 4 km of length. Considering the pipeline's diameter of 600 mm, a total volume of water of 2,400 m<sup>3</sup> for the hydrotesting of each section is predicted. A pump with an approximate withdrawal rate of 1m<sup>3</sup>/s is expected to be used.

#### *Impact assessment*

Several aboveground water features exist along the project area: rivers, creeks, artificial lakes, wetlands (not Ramsar sites) and lakes. The location of the surface water features can be consulted in Section 7.1.8 and Annex 16.7 (Map 6).

A site visit to the project area was undertaken in October 2014 after a long dry period. Due to this, only little evidence of high groundwater levels has been found. The hydrogeology of the area shall be identified by the construction contractor by means of a due investigation before construction works begin.

The risks related to the surface water crossings (bullet point **a**) above) are considered whenever a water feature shall be crossed by any of the options. The risks of water contamination by incorrect disposal, accidental run-off and hydrostatic testing fluid, as well as the risks for over usage of water for hydrotesting (bullet points **b**) and **c**) above) are considered for this assessment when the construction activities are undertaken in a distance inferior to 500 m to surface water features.

The specific sites where negative effects in the water features may be felt during construction of the pipeline are shown in Map 6 in Annex 16.7 for both options.

By considering the number of crossings and the water impact area as previously described, it has been determined which of the routes implies a larger impact in the water features in the area. The results can be consulted in Table 8-9.

**Table 8-9: Impacts on the physical environment - water - number of crossings and affected area and length**

Option	Impact on water			
	Number of crossings		Impacts due to discharge, run-off and hydrostatic testing (500 m distance to works)	
	Rivers	Lakes, wetlands and	Lakes, wetlands and reservoirs: Possible	Rivers: Possible Impact length [km]

		reservoirs	Impact area [ha]	
1b	24	1	138.23	61.96
2	32	1	81.82	63.57

The results show that Option 2 implies a larger number of crossings (32% more), but a smaller area of possibly affected lakes/reservoirs/wetlands than Option 1b (41% less). The extent of possibly impacted rivers is almost the same for both options. Distinguishing the significance of impacts on water features between the two options is as therefore not possible.

### **Mitigation**

#### *a) Crossings of surface water*

A Hydrological Survey shall be undertaken by the construction contractor during the detailed design phase.

Considering the relatively large number of water crossings, it is necessary to obtain more detailed information about the surface water features in the area. A Hydrological Survey of the affected area shall be undertaken by the construction contractor during the detailed design phase and covering Winter and Summer periods that will allow:

- making a detailed inventory of all pipeline crossings;
- determining the width and depth of the rivers and other water features to be crossed - it is known that in the project area only small and low flow streams are expected to be crossed;
- identifying those features prone to erosion and water channel changes;
- determining any perennial water features and the period of the year when these may be dry or have lower water levels;
- determining the areas where aquatic vegetation is scarce or absent (to be preferably used as crossing location unless other limitations exist);
- flagging the boundaries of wetlands.

The information obtained from the pre-construction Hydrological Survey will allow the contractor to develop a Water Crossings Management Plan as part of its HSE Plan for construction.

The Water Crossings Management Plan will define the water crossings' timing and technique according to the water features' characteristics. The Water Crossings Management Plan shall also be based on the Aquatic Life Survey described below in Section 8.1.2.3 of this ESIA. In general, the Plan shall be based on the following hierarchy:

- 1st: avoidance of crossing areas where sensitive habitats, spawning, feeding, over-wintering or nursery areas, or protected species are present);



- 2nd: usage of open-cut wet ditch crossing methods;
- 3rd: usage of open-cut dry ditch crossing methods.

More specifically, the following shall be part of the Water Crossings Management Plan:

- depending on the results of the Aquatic Life Survey, plan water crossing activities in such a way not to disturb the ecological activities supported by the river (ex. spawning season).
- if no ecological activities supported by the water courses are expected in summer, plan water crossing during summer low flows and low water level;
- in case of seasonal streams, plan the crossing when the stream is dry;
- in-stream construction activities (including trenching, pipe installation, backfill, and restoration of the streambed contours) shall be completed in the shortest time possible; crossings of small watercourses (<10 m wide) can often be completed in less than a day while one to three days are generally required for medium sized crossings (10-20 m) (Reid & Anderson, 1999);
- plant to undertake the crossings preferably on areas where aquatic vegetation is scarce or absent;
- the riparian vegetation will be cleared only immediately before the crossing is undertaken, to minimize erosion of the river banks; this shall be considered even if it implies that the clearing of riparian vegetation will be undertaken in a different period than that of the terrestrial vegetation;
- no crossing shall be planned to areas where sensitive habitats and fish spawning, feeding, over-wintering or nursery areas exist (as a result of the Aquatic Life Survey - see Section 8.1.2.3 of this ESIA);
- if the Aquatic Life Survey detects species which are highly sensitive to release of sediments into the water, no wet crossing shall be planned to be undertaken up to 1 km upstream of the areas of such species. In such cases, either the crossing is undertaken on another location or a dry ditch method shall be used.
- all disturbed areas of the work site shall be stabilized immediately:
  - all water body banks will be restored to preconstruction contours and to a stable condition;
  - where present, existing gravel and cobble streambed materials will be used for restoration of the streambed and banks;
  - reno mattresses and gabions will be used to stabilize steep banks and escarpments;
  - disturbed riparian areas will be re-vegetated with conservation grasses or native plant species.

*b) Discharge and run-off*

The water pollution risks can be reduced with a proper HSE construction site management, including measures for waste materials and handling of hazardous materials. The Waste Management Plan to be developed by the Construction Contractor (previously referred to in Section 8.1.1.2 of this ESIA) shall include measures for liquid waste streams including:

- Providing temporary toilet facilities at all camps and along the entire RoW, as well as guarantying the proper disposal of the waste water.
- Store the liquid hazardous waste on separate locations on site with the following characteristics:
  - Minimum distance of 50 meters to water courses;
  - Do not locate the storage area in slopes leading to water courses;
  - Labeled, enclosed and impermeable containers;
  - Basement made of impermeable plastic layers;
  - Safety sheets available in the containers.

Providing temporary toilet facilities along the entire ROW and the workers camps, as well as guarantying the proper disposal of the waste water generated shall be assured in order to avoid contamination. The discharge of raw wastewater directly into the environment shall not be allowed.

Ideally, vehicle maintenance and washing occurs in garages and washing facilities, not on active construction sites. However, if these activities must occur onsite, operators should follow appropriate measures to prevent untreated nutrient-enriched wastewater or hazardous wastes from being discharged to surface or ground waters, such as:

- Refueling and lubrication of equipment, as well as washing and maintenance, shall not be undertaken at a distance shorter than 50 m from surface water features.
- Clearly mark all washing and maintenance areas, and inform workers that all washing/maintenance must occur in this designated area.
- These areas shall be properly connected to a storm drain system; contaminated drainage must be orderly disposed of as hazardous waste.
- To avoid contamination of ground water, these activities shall only be undertaken above a proper isolating and impermeable surface.
- Dispose of all used oil, antifreeze, solvents and other automotive-related chemicals according to manufacturer instructions and national laws.

The construction contractor shall prepare a Spill Prevention and Cleanup Plan.

In slope areas leading to water courses, it is necessary to avoid site sediment runoff from reaching the water courses. Map No. 4 in Annex 16.7 shows where these areas can be found within the project area. The results of the Landslides and Erosion Survey will complement the data show in this map. This can be done by, e.g.:

- Implement erosion control structures (blankets, mats, geo-textiles) before the works begin.
- In alternative to the above, the slopes leading to water courses may be track walked up and down to improve the stability of the soil.
- Install sand or gravel bags along the working area to absorb any sediment or other runoff before it reaches the water courses.

*c) Hydrostatic testing*

To avoid an overuse of water for hydrostatic testing, the water shall be obtained from nearby water resources or municipal sources in accordance with applicable permits for the withdrawal of water. Chapter IV of the Moldovan Water Law regulates the water usage permitting procedures. According to this law, all uses of water which do not include human consumption, domestic needs, animal needs, irrigation next to houses, and storage for firefighting or emergencies are classified as „special use of water“ and imply the application for an environmental permit (Article 23).

Regarding international standards, the IFC recommends that the test water withdrawal rate (or volume) should not exceed 10 percent of the stream flow (or volume) of the water source (IFC, 2007b).

It is predicted that a pump with a maximum capacity of 1 m<sup>3</sup>/s is used to collect hydrotesting water from the selected source. On the project site, three main (small) rivers have been identified: Prut, Delia and Bic. The maximum and minimum discharge rates of each of these rivers are shown in Table 8-10.

**Table 8-10: Discharge rate of rivers in the project area (source: Ministry of Environment of Moldova)**

<b>River</b>	<b>Maximum discharge rate (m<sup>3</sup>/s)</b>	<b>10% thereof (m<sup>3</sup>/s)</b>	<b>Minimum discharge rate (m<sup>3</sup>/s)</b>	<b>10% thereof (m<sup>3</sup>/s)</b>
Prut	738 (09.07.2010)	73.8	11.1 (22,23.01.1991)	1.11
Delia	47.1 (04.07.1987)	4.71	N.A.	N.A.
Bic	47.2 (20.06.1985)	4.72	0.002 (12.01.1968)	0.0002

Assuming that these rivers are used as water sources for hydrotesting, the data from Table 8-10 show that the pump withdrawal rate of 1 m<sup>3</sup>/s would comply with the IFC recommendation. This is because for most rivers the 1 m<sup>3</sup>/s withdrawal rate would be below 10% of their discharge rates. The exception is verified for the lowest rates of the Bic River.

Other sources may be used for obtaining water for hydrotesting, namely underground sources or surface reservoirs. In these cases, the construction contractor shall assure that the withdrawn volumes do not represent more than 10% of the total volume of the selected source. An approximate volume of 4,500 m<sup>3</sup> of water will be needed for each section being tested. There is no information at present that allows to know which water sources in the area could be sustainably used.

Despite the calculations shown above related to the IFC recommendation, a permit from the authorities needs to be obtained before hydrotesting, and this permit shall be the document assuring the sustainability of the process.

The disposal alternatives for test waters following hydrotesting include injection into a disposal well (if one is available) or discharge to surface

waters or land surface. If discharge to surface waters or land surface is necessary, the IFC recommendations shall be followed to avoid severe impacts (IFC, 2007b). Some examples are:

- Reduce the need for chemicals by minimizing the time that test water remains in the equipment or pipeline;
- Use the same hydrotest water for multiple sections;
- Hydrostatic test water quality must be treated to meet the applicable discharge limits (Section 4.4 or others as per Environmental Permit);
- Use break tanks or energy dissipaters (e.g. protective riprap, sheeting, tarpaulins) to prevent erosion from the discharge flow;
- If discharged to land, the discharge site must be selected to prevent flooding, erosion, or lowered agriculture capability of the receiving land.

Any disposal methods and requirements stated in the water use permit shall be strictly followed.

*d) Specific measures for the wetlands*

Additional measures shall be predicted for protection of the wetlands crossed by the pipeline, namely:

- Wetland boundaries shall be marked in the field with signs and/or flagging.
- Work areas (such as storage and deposit areas) are prohibited in wetlands. Any additional working area, if required, shall be located a minimum of 50 m away from wetland boundaries.
- Remove all cut trees and branches from the wetland and stockpile in an upland area; give the materials to the local inhabitants, if they so desire; in case there is no interest from the community, save the materials for disposal.
- No access roads shall be constructed on wetlands.
- Assemble the pipeline in an upland area unless the wetland is dry enough to adequately support skids and pipe.
- Seed, fertilizers or mulch shall not be applied in wetlands for re-vegetation purposes. Restrict the use of fertilizer within 50 m of wetlands. The ROW/safety strip in wetland areas shall not be reseeded unless specified by the appropriate government agency (DEGT, 2006).

### **Classification of impacts**

The classification of impacts on the water resources can be consulted in Table 8-11 for both options.

**Table 8-11: Classification of the impacts on the water resources - construction phase**

<b>Impacts on water resources (quantity and quality) - Construction phase</b>		
<b>Factors</b>	<b>Option 1b</b>	<b>Option 2</b>
Scale	Local	Local

Duration	Temporary, short term	Temporary, short term
Severity	Medium	Medium
Certainty	Definitive	Definitive
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	Yes	Yes
Specialist study?	Yes (Hydrological survey)	
<b>Significance</b>	Medium	Medium
<b>Mitigation measures applicable?</b>	Yes	
<b>Compensation measures applicable?</b>	No	
<b>Significance of the residual impacts</b>	Low	Low

#### 8.1.1.4 Air Quality

The construction of the pipeline, associated infrastructures and workers camps will cause gaseous and particulate air emissions.

Initially, these will be associated to the clearing and trenching activities (stages 1 and 6 on Section 8.1). The trucks used to transport and haul away materials, as well as other construction equipment's movements will also be a source of air emissions in the project area. The construction of the above ground facilities (GPRS, pigging stations and block valve stations) will in addition imply excavations, concreting, backfilling, etc. All these activities are potentially generators of air emissions, especially of dust.

According to the UK institute of Air Quality Management, the air quality effects of a construction site shall be assessed whenever there is a human receptor within 350 m of the boundary of the site (Holman *et al*, 2014).

A broad impact zone of 350 m of width on each side of the pipeline is considered for air quality impacts. No residential areas will be directly crossed by the pipeline but several of these are located in a distance less than 350 meters from the pipeline axis, implying a possibility for impact. The specific sites where negative effects caused by air emissions may be felt during construction of the pipeline are shown in Map 7 in Annex 16.7 for both options.

The area of potentially affected residential zones can be consulted in Table 8-12.

**Table 8-12: Impacts on the physical environment during construction - air quality - affected area**

Option	Residential areas affected by air pollution (350 m distance to works) [ha]
1b	103.48

The results indicate that Option 2 has a larger expected affected area for air emissions. The totally potentially affected area would be of 8,400 ha for Option 1b and 7,900 ha for Option 2 (350 m to each side of the axis times the total length of the pipe). This shows that the impact on air quality has a low spatial importance.

Other impacts on the air quality during construction are related to the air emissions derived from the diesel generators that will work to provide energy to the workers camps and some construction equipment. The typical main pollutants to be emitted are CO, CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>2</sub>, and Particulate matter.

### **Mitigation**

The impacts of air pollution can be significantly reduced by:

- Trucks and vehicles crossing housing areas shall reduce their speed to a maximum of 30 km/h (also for safety reasons);
- The vehicles and equipments shall be kept in good maintenance state;
- Spray unpaved areas subject to vehicle movements with non-drinkable water in case dust suspension is visible and considered critical; keep in mind that this activity must not result in the formation of puddles, lead to rutting by equipment or vehicles, tracking of mud onto roads or siltation of watercourses;
- Cover the trucks transporting earth and pulverous materials with tarpaulins;
- Do not store earth and pulverous materials in open air if windy conditions are expected;
- Keep diesel generators further away from the workers occupations and residential areas.

### **Classification of impacts**

The classification of impacts on air quality can be consulted in Table 8-13 for both options.

**Table 8-13: Classification of the impacts on the air quality - construction phase**

<b>Impacts on air quality - Construction phase</b>		
<b>Factors</b>	<b>Option 1b</b>	<b>Option 2</b>
Scale	Local	Local
Duration	Temporary, short term	Temporary, short term
Severity (comparative) *	Low	Medium
Certainty	Possible	Possible
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct

Cumulative?	Yes	Yes
Specialist study?	No	
<b>Significance</b>	Low	Medium
<b>Mitigation measures applicable?</b>	Yes	
<b>Compensation measures applicable?</b>	No	
<b>Significance of the residual impacts</b>	Low	Low

\* The severity is assessed in a comparative way and depends on the area where sensitive receptors for air emissions are present for each option

#### 8.1.1.5 Noise levels

The construction of the pipeline, associated infrastructures and workers camps will cause noise emissions.

Initially, the noise will be associated to the clearing and trenching activities (stages 1 and 6 on Section 8.1). The trucks used to transport and haul away materials, as well as other construction equipment's movements will also be an important source of noise in the project area. Activities such as hauling (stage 2), stringing (stage 4), welding (stage 4) and lowering (stage 7) will additionally have an impact. The construction of the above ground facilities (GPRS, pigging stations and block valve stations) will also imply excavations, concreting, backfilling, usage of pumps and compressors, etc. All these activities are potentially noisy.

According to the USEPA (1971), in general average equivalent noise levels from typical construction sites range from 85 to 91 dBA at 50 feet (ca. 15 meters) from the sites. For the ESIA, it is assumed a worst-case noise level of 91 dBA at 50 feet from the pipeline construction site. Considering a typical 6 decibel reduction in noise level per doubling of distance, it results that only 3,200 feet (or ca. 1,000 m) away a noise drop to 55 dBA (the IFC limit for day time in residential areas - Section 4.4) could be reached.

Given the above, a broad impact zone of 1,000 m on each side of the pipeline is considered for noise impacts in the residential areas. This impact zone is defined under the assumption that no dampening or magnifying effects of noise exist between the source and the receptors.

No residential areas will be directly crossed by the pipeline but several of these are located in a distance inferior to 1,000 meters from the pipeline axis, implying a possibility for impact. The specific sites where negative effects caused by noise emissions may be felt during construction of the pipeline are shown in Map 7 in Annex 15.7 for both options. The area of potentially affected residential zones can be consulted in Table 8-14.

**Table 8-14: Impacts on the physical environment during construction - noise - affected area**

Option	Residential areas potentially affected by noise (1,000 m distance to works) [ha]
1b	949.92
2	1132.83

The results indicate that Option 2 has a larger potentially expected affected area for construction noise. In comparison to the potentially affected area (1,000 m to each side of the axis for the total length of the pipe: 12,000 ha for Option 1b and 13,000 ha for Option 2), the impact has a low spatial importance for both options.

### **Mitigation**

To minimize the impacts of noise on the community, trucks and vehicles crossing housing areas shall reduce their speed to a maximum of 30 km/h, and the construction works shall be restricted to daylight hours. In case there is a need to perform activities during the night hours (19h-7h) it shall be assessed whether a permit is needed. In such cases, the population shall be previously informed.

The vehicles and equipments shall be kept in good maintenance state. If generators are used, they shall be located far from the residential areas and the workers accommodations at a distance that will allow attenuation of noise to a level within project limits. In case this is not possible, sound barriers such as portable or free-standing screens shall be installed around the generators.

Trucks and vehicles crossing housing areas shall reduce their speed to a maximum of 30 km/h, also for safety reasons.

### **Classification of impacts**

The classification of impacts on the air quality and noise levels from the construction phase can be consulted in Table 8-15 for both options.

**Table 8-15: Classification of the impacts on the noise levels - construction phase**

Impacts on noise levels - Construction phase		
Factors	Option 1b	Option 2
Scale	Local	Local
Duration	Temporary, short term	Temporary, short term
Severity (comparative) *	Low	Medium
Certainty	Definite	Definite
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	No	No
Specialist study?	No	



<b>Significance</b>	Low	Medium
<b>Mitigation measures applicable?</b>	Yes	
<b>Compensation measures applicable?</b>	No	
<b>Significance of the residual impacts</b>	Low	Low

\* The severity is assessed in a comparative way and depends on the area where sensitive receptors for noise emissions are present for each option

#### 8.1.1.6 Landscape and visual impacts

The construction activities will have temporary and permanent impacts on the landscape and the aesthetics of the area:

- a) Temporary impacts: presence of machinery, piles of excavated soil, and construction materials; dust emissions.
- b) Permanent impacts: cleared areas.

##### *a) Temporary impacts*

During construction heavy machinery and equipment will circulate around and within the pipeline section being installed. Piles of excavated material, storage and borrow areas, and deposits of construction material and wastes will be seen within the construction strip. Clouds of dust originated from the machinery movements and earth activities will cause an additional impact in the area.

Because the construction of the pipeline is a linear work, each section of the pipe will be affected only for very short fractions of time (weeks).

##### *b) Permanent impacts*

The establishment of the construction strip will force the vegetation clearing within a width of 16 meters; the establishment of the safety strip will raise this distance to 50 meters. In the construction strip, all plants will be removed. In the safety strip or right of way (ROW) (to be established after construction), only deep rooting plants such as bushes and trees (vineyards, orchards and forest trees) will not be allowed. This means that agricultural crops like vegetables and cereals, as well as pasture land, can exist above the pipeline once it is operating.

The project area is not a place of touristic importance, which partly lowers the significance of the impacts on the landscape.

The crossing of the natural forest reserve Seliște-Leu in Nisporeni is planned to be made parallel to an existing pipeline. However, due to the distance that shall be kept between the two pipelines, an additional fall of trees is expected in this area. Also in Nisporeni, the landscape reserve Cazimir - Milești is located in a very short distance to the pipeline axis (in fact, the axis is so far designed to run parallel to the border of this reserve). This implies the permanent removal of trees in case the detailed design does not allow a distance of over 25 meters from the axis to the landscape reserve.

Several other forest areas (non-protected) are expected to be crossed by the pipeline, for what the removal of trees and, as therefore, the landscape impacts will be unavoidable.

The specific sites where permanent negative effects in the landscape may be felt during operation of the pipeline are shown in Map 8 in Annex 15.9 for both options.

By considering the area of forests (protected and non-protected), vineyards and orchards that shall be removed from the 50 m safety strip as previously described, it has been determined which of the routes implies a larger permanent impact in the landscape in the area. The results can be consulted in Table 8-16.

**Table 8-16: Impacts on the physical environment during construction - landscape - affected area**

Option	Area of permanent impact on the landscape [ha]				
	Vineyards	Non-protected forest	Protected areas/forest	Orchards	TOTAL
1b	38.38	39.04	0.41	46.24	122.07
2	46.32	23.34	1.69	24.81	96.16

The results presented in Table 8-16 show that Option 1b implies a larger impact on the landscape, as a larger area of trees and vineyards shall be permanently removed from the ROW.

### **Mitigation**

#### *a) Temporary impacts*

As soon as the construction activities end, all the construction equipment shall be removed and all the debris shall be collected from all work areas, including RoW, construction camps, pipe laydown yards, etc.. Measures to restore the landscape like re-cultivation of deposition and passage areas, as well as of the construction and safety strips shall additionally be taken considering the legal restrictions. This means that no deep rooting plants can be re-planted above the pipeline (50 meters width safety strip).

To avoid impacts related to the emissions of dust, the measures predicted in Section 8.1.1.4 shall be considered.

#### *b) Permanent impacts*

To avoid permanent landscape impacts, during the pre-feasibility study and the scoping phase route options have been chosen that minimize the passage through forested, orchard and vineyard areas. The chosen route options have been additionally optimized with the same objective (please refer to Section 6 for detailed information). The construction contractor shall, during

the detailed design phase continue optimizing the route in such a way to avoid passage through or proximity to these areas. In particular, the proximity to the landscape reserve Cazimir - Milești in Nisporeni shall be reviewed., i.e., the line shall be deviated in such a way to avoid the fell of trees and disturbances within this reserve.

### **Classification of impacts**

#### *a) Temporary impacts*

The classification of the temporary impacts on the landscape from the construction phase can be consulted in Table 8-17 for both options.

**Table 8-17: Classification of the temporary impacts on the landscape - construction phase**

<b>Temporary impacts on landscape (presence of construction elements; dust emissions) - Operation phase</b>		
<b>Factors</b>	<b>Option 1b</b>	<b>Option 2</b>
Scale	Local	Local
Duration	Temporary, short term	Temporary, short term
Severity (comparative) *	Low	Medium
Certainty	Definite	Definite
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	No	No
Specialist study?	No	
<b>Significance</b>	Low	Medium
<b>Mitigation measures applicable?</b>	Yes	
<b>Compensation measures applicable?</b>	No	
<b>Significance of the residual impacts</b>	Low	Medium

\* The severity is assessed in a comparative way and depends on the length of each option.

#### *b) Permanent impacts*

The classification of the permanent impacts on the landscape from the operation phase can be consulted in Table 8-18 for both options.

**Table 8-18: Classification of the permanent impacts on landscape - construction phase**

<b>Permanent impacts on landscape (clearance) - Construction phase</b>		
<b>Factors</b>	<b>Option 1b</b>	<b>Option 2</b>
Scale	Local	Local
Duration	Permanent	Permanent
Severity (comparative) *	High	Medium
Certainty	Definite	Definite
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct

Cumulative?	No	Partly (in the Seliște-Leu Reserve)
Specialist study?	No	
<b>Significance</b>	Medium	High
<b>Mitigation measures applicable?</b>	Yes	
<b>Compensation measures applicable?</b>	No	
<b>Significance of the residual impacts</b>	Low	Medium

\* The severity is assessed in a comparative way and depends on the area of vineyards, orchards and forest trees which are removed from the safety strip for each option.

### 8.1.2 Impacts on the Natural Environment

The pre-feasibility and scoping stages of the project allowed the determination and refinement of the route in such a way to avoid to the maximum the crossing of natural features (forests, natural reserves, core areas (NEN)), as well as water features<sup>2</sup>. However, some of these features are still planned to be crossed or to neighbor the pipeline, as can be seen in Map 8 and Map 6 in Annex 16.7.

The National Ecological Network defined, in addition and in connection to the core areas, "major biodiversity values", "target species" and "ecological corridors". Maps 1, 2 and 3 in Annex 16.7 show how the pipeline routing options cross the areas where the NEN has catalogued major biodiversity values and target species, and has defined ecological corridors.

The NEN uses the following scale to quantify the presence of species of fauna and flora in the core areas:

- Very high
- High
- Significant
- Insignificant
- Not evaluated.

The maps show that the pipeline (Option 1b) is expected to run nearby the **Plaiul Fagului Reserve** (100 meters distance), which is in addition a national importance core area as per the NEN. Within this reserve and core area, a "very high" number of mammals, and a "high" number of insects and higher plants have been identified by the NEN (Map 1). From these, a "very high" number of mammals is protected by the Bern Convention, a "high" number of insects is included in the IUCN Red List and a "high" number of higher plants is considered threatened as per the Moldovan Law (Map 2).

The maps also show that Option 2 crosses directly the **Seliște-Leu Natural forest reserve** in Nisporeni. This reserve is part of the local importance core

<sup>2</sup> Although water has been considered as a component of the physical environment, in the context of this section it is once more mentioned in order to consider the impacts on aquatic life and riparian vegetation

area Selisti-Leu. This crossing is planned to be made parallel to an existing pipeline. Due to the safety distance that shall be kept between the two pipelines, an additional fall of trees is expected in this area. The Selisti-Leu core area has lower numbers of biodiversity values and target species than the Plaiul Fagului Reserve (Maps 1 and 2).

Also in Nisporeni, the **Landscape Reserve Cazimir - Milești** is located in a very short distance to the pipeline axis (Option 2) (in fact, the axis is so far designed to run parallel to the border of this reserve). This implies the permanent removal of trees in case the detailed design does not allow a distance of over 25 meters from the axis to the landscape reserve. This reserve is also a core area as per the NEN. In this core area, a “high” number of reptiles and amphibians exist, with a significant number of these included in the NEN Operational List.

Map 3 in Annex 15.6 shows that both options cross a planned national **ecological corridor**. Within the project area, this corridor runs between the core areas Plaiul Fagului and Codrii.

#### 8.1.2.1 Natural protected areas

The pre-feasibility and scoping stages of the project allowed the determination and refinement of the route in such a way to avoid to the maximum the crossing of particularly sensitive areas, such as nature reserves/core areas. However, it was not possible to avoid:

- the crossing of the natural forest reserve Seliste-Leu, in Nisporeni (Option 2), which is part of the NEN core area Selisti-Leu.
- bordering the landscape reserve Cazimir-Milești in Nisporeni (Option 1b), which is also a core area as per the NEN.
- running nearby (100 m) the Plaiul Fagului Reserve with Option 1b, and crossing its protective buffer as defined in the Government Decision No. 167 of 12.03.1992. This reserve is also a national importance core area as per the NEN.

The map showing the crossings can be consulted in Annex 15.7 (Map 8). Table 8-19 describes the impacted protected areas for each option in terms of affected area (ha), major biodiversity values and target species (NEN).

**Table 8-19: Impacts on the natural environment during construction - protected areas - impacted area, major biodiversity values and target species**

Option	Impacts on protected areas		
	Impacted Protected forest [ha]	Major biodiversity values (NEN)	Target species (NEN)
1b	0.41	Crosses the protection buffer of the Plaiul Fagului Reserve, which has a: <ul style="list-style-type: none"> <li>• very high number of</li> </ul>	Crosses the protection buffer of the Plaiul Fagului Reserve, which has a: <ul style="list-style-type: none"> <li>• very high number</li> </ul>

Option	Impacts on protected areas		
	Impacted Protected forest [ha]	Major biodiversity values (NEN)	Target species (NEN)
		mammals <ul style="list-style-type: none"> <li>• high number of insects</li> <li>• high number of higher trees</li> </ul> Borders the Landscape Reserve Cazimir - Milești, which has: <ul style="list-style-type: none"> <li>• a high number of reptiles and amphibians</li> <li>• no evaluation of the amount of higher trees</li> </ul>	of mammals protected by the Bern Convention <ul style="list-style-type: none"> <li>• high number of insects included in the IUCN Red List</li> </ul> Borders the Landscape Reserve Cazimir - Milești, which has: <ul style="list-style-type: none"> <li>• a significant number of reptiles and amphibians in the NEN Operational Checklist</li> <li>• no evaluation of the amount of threatened higher trees (national law)</li> </ul>
2	1.69	Crosses directly the Seliște-Leu Natural forest reserve, which has a: <ul style="list-style-type: none"> <li>• significant number of insects, amphibians, reptiles and mammals</li> <li>• significant number of higher trees</li> </ul>	Crosses directly the Seliște-Leu Natural forest reserve, which has a: <ul style="list-style-type: none"> <li>• significant number of mammals protected by the Bern Convention</li> <li>• significant number of insects included in the IUCN Red List</li> <li>• significant number of threatened higher trees (national law)</li> </ul>

The results show that Option 2 crosses a larger area of natural reserves than Option 1b. An analysis per affected reserve is as follows.

#### **Plaiul Fagului reserve**

Option 1b runs 100 meters away from the Plaiul Fagului reserve, which contains a high number of threatened higher trees, a very high number of protected mammals, and a high number of insects included in the IUCN Red List. This suggests a high importance and sensitivity of this reserve.

The fact that the pipeline passes 100 meters away from Plaiul Fagului means that no fall of trees will be necessary inside this reserve for the construction and the establishment of the ROW/safety strip. However, the protective buffer of 1.5 km width created around this reserve by the Government Decision No. 167 (Section 4.1.5) will be affected by the project (Figure 8-4).



**Figure 8-4: Protection buffer of the Scientific Reserve Plaiul Fagului (orange line)**

Within the protection buffer, the soil is presently extensively used for agriculture, orchards, vineyards, gardens, and pastures. Forest is crossed in a small length and there is also a water crossing of a small stream.

Annex 16.1 contains the lists of nationally and internationally protected animal and plant species that live within the Plaiul Fagului reserve. Tables with the species that are listed in the IUCN Red List and the Moldova Red Book can be found in Section 7.2.1. There is a *possibility* that these species are also found in the different land use categories within the buffer zone: in forested areas (bats which winter in old oak trees like the Leisler's Bat; beetles; North Crested Newt; European Honey-buzzard), in the agricultural areas (rodents, weasels, European Roe Deer), in the vineyards and orchards (European Hedgehog, European Green Lizard), in the pasture areas (Speckled Ground Squirrel), and in the aquatic habitats (Ferruginous Duck; Eurasian Otter).

From the species identified within the Plaiul Fagului reserve, one is listed as Endangered in the IUCN Red List: the Saker Falcon. No species is listed as internationally Critically Endangered. According to EBRD's PR 6 (Biodiversity Conservation and Sustainable Management of Living Natural Resources), the presence of Saker Falcon in the project area could imply the existence of a **Critical Habitat**, a habitat which could be "considered critical by virtue of its importance to the survival of endangered or critically endangered species" (EBRD, 2008).

After consultation with experts and analysis of existing data, it is assessed that no *nesting habitats* for the Saker Falcon exist within the reserve or its buffer. On the other hand, *feeding/hunting habitats* may be present. The

Saker Falcon hunts in open areas such as pastures and cultivated ground, which are present within the buffer of the Plaiul Fagului reserve. One of its main preys is the Speckled Ground Squirrel, a species which can be found in the Plaiul Fagului Reserve, and whose presence in the buffer cannot be excluded. As therefore, any disturbances to pasture and agricultural areas due to the project could affect the Saker Falcon's hunting habitat. However, the construction-induced disturbances will be limited in space and time, and the operation of the pipeline will not interfere with the agricultural fields and pastures.

It is concluded that no Critical Habitat as per EBRD PR 6 (2008) could be significantly affected by the project.

### **Cazimir-Milesti reserve**

Option 1b borders the reserve Cazimir-Milesti, implying a possible fell of trees within it. In this reserve, a significant number of reptiles and amphibians are in the NEN Operational Checklist. Although the NEN has not made an evaluation of the amount and preservation status of the trees in this reserve, a possible negative impact shall be accounted for. In the detailed design phase, impacts on trees, reptiles and amphibians can be avoided by shifting the pipeline away from the border of the reserve.

Annex 16.1 contains the lists of nationally and internationally protected animal and plant species that live within the Cazimir-Milesti reserve. Tables with the species that are listed in the IUCN Red List and the Moldova Red Book can be found in Section 7.2.1. Two animal species and no plant species are classified by the IUCN Red List in a level higher than Least Concern. These are the European Turtle Dove (Vulnerable) and the European Pond Turtle (Near Threatened).

The movement of workers and machinery close or within this reserve, as well as the clearing and excavation works will pose a danger to the species living in this area, especially to those protected under national and international instruments. The pipeline shall be deviated from the border of this reserve to avoid direct impacts.

### **Seliște-Leu reserve**

Option 2 crosses a national reserve (Seliște-Leu) in parallel to an existing pipeline. However, in order to keep a safety distance between both pipelines, a mandatory additional fall of trees will be unavoidable. Because this reserve has a "significant" number of threatened higher trees, protected mammals and insects in the IUCN Red List, the impacts are even more important.

Annex 16.1 contains the lists of nationally and internationally protected animal and plant species that live within the Seliște-Leu reserve. Tables with the species that are listed in the IUCN Red List and the Moldova Red Book can be found in Section 7.2.1. There are no plant or animal species within the Seliște-Leu reserve which are classified by the IUCN Red List in a level higher than Least Concern.



### **Impact classification**

Option 1b implies the loss of less protected area than Option 2 (0.41 vs 1.69 ha), and which is less rich in threatened and protected species (Cazimir-Milesti vs Seliște-Leu). In addition, the fall of trees on the ROW of protected areas in Option 1b can be avoided, but that of Option 2 cannot. For these reasons, Option 2 is classified as having a more significant impact on protected areas than Option 1b.

None of the project options is expected to impact the functionality of the designated areas, as well as the survival of the species which live/nest/winter within or seasonally pass by these reserves.

### **Mitigation**

To avoid impacts on protected areas, during the pre-feasibility study and the scoping phase route options have been chosen that minimize the passage through these areas. The chosen route options have been additionally optimized with the same objective (please refer to Section 6 for detailed information). The construction contractor shall, during the **detailed design** phase continue optimizing the route in such a way to avoid passage through or proximity to these areas:

- In particular, the proximity to the landscape reserve Cazimir - Milești in Nisporeni shall be reviewed, i.e., the line shall be deviated in such a way to avoid the fall of trees and disturbances within this reserve. This will avoid any impacts on the protected species listed under the IUCN Red List (European Turtle Dove and European Pond Turtle), as well as those listed under the Moldovan Red Book and other protection instruments. Any deviations beyond the 1,000 meters investigation corridor, or that imply the crossing of protected areas or force the re-location of buildings shall be subject to the approval of the lenders.

Specifically for protection of the natural reserves, the following measures shall be followed **during construction**:

- To prevent animals from falling into open trenches, wildlife escape ramps from open trenches shall be constructed in sensitive locations, namely when crossing or passing by the reserves and core areas of the NEN (please refer to Maps 1 and 2 in Annex 16.7):
  - Passage through the protection buffer of Plaiul Fagului (Option 1b);
  - Passage close by the reserve Cazimir - Milești (Option 1b);
  - Crossing the reserve Seliște-Leu (core area Selisti-Leu) (Option 2).

The escape ramps shall be built along the trench in the way depicted in Figure 8-5, i.e., parallel to the trench line.



**Figure 8-5: Wildlife escape ramp (NMDGF, 2007)**

Initially the escape ramps shall be built every 1 km where crossing or passing close by the above listed reserves. A walk-through shall be undertaken everyday and any trapped animals shall be carefully released. If the daily walk-through reveals that animals get regularly trapped inside the trenches and cannot escape due to the relatively large distance between escape ramps (like registered by Doody *et al*, 2003 for the case of small animals), these shall be placed every 500 meters.

- Limit the length of open trench to 10-12 km at any given time. This shall be made not only when constructing nearby reserves, but as a general measure along the entire construction site.

**Table 8-20** describes other measures and pre-construction surveys that shall be specifically undertaken for **protection of species classified in the IUCN Red List** (except Least Concern) and the **Moldovan Red Data Book** which may be impacted by the construction activities. In the project area, such protected species could be affected during the passage through the buffer of the reserve Plaiul Fagului (Option 1b) or during the crossing of the reserve Seliște-Leu. The bordering of the reserve Cazimir-Milesti shall be avoided by the Contractor by deviating the pipeline route, for what no protected species are expected to be affected.

**Table 8-20: Mitigation measures, including pre-construction surveys, for protected species listed in the IUCN Red List and the Moldova Red Data Book (for Option 1b and Option 2)**

Class	Species	IUCN Red List classification	Moldova Red Data Book classification	Presence at site	Measures
<b><i>Buffer zone of the Plaiul Fagului Reserve (Option 1b):</i></b>					
Mammals	Speckled Ground Squirrel	NT	--	The Speckled Ground Squirrel may be found in the pastures and cultivated ground within the protection buffer of the Plaiul Fagului Reserve. Impacts related to direct killing may be expected, especially as this species is seen in many locations as an agricultural pest.	The direct killing of any animal during construction shall be forbidden.
	Eurasian Otter	NT	CR	A small stream within the protection buffer of the Plaiul Fagului reserve shall be crossed by the pipeline. There is the possibility that Eurasian Otter nests are built in the banks of this small stream, given the presence of this species within the reserve.	As part of the Aquatic Life Survey (see Section 8.1.2.3 below), the stream banks shall be inspected for otter dens (normally a hole on the river bank indicates the presence of a den ca. 1 or 2 meters deep). In case one inhabited den is found, the pipeline shall be deviated to avoid disturbance or destruction of the den or killing/injuries of otters.
	Bicolored Shrew	LC	CR	The Bicolored Screw inhabits a wide range of ecosystems, but in central Europe it concentrates in open agricultural areas. Within the buffer of the Plaiul Fagului Reserve, such areas are present, for what the presence of specimens cannot be excluded.	The direct killing of any animal during construction shall be forbidden.
	Stoat	LC	VU	Stoats are habitat generalists found wherever suitable prey (small mammals) is available. It is possible that specimens of Stoat are found within the buffer of the Plaiul Fagului Reserve.	The direct killing of any animal during construction shall be forbidden.
	Pine Marten	LC	VU	The Pine Marten inhabits	The direct killing of any animal during construction shall

Class	Species	IUCN Red List classification	Moldova Red Data Book classification	Presence at site	Measures
				deciduous, mixed and coniferous woodlands, as well as scrub areas. It is unlikely that this species is found within the buffer of the Plaiul Fagului Reserve.	be forbidden.
	Wild Cat	LC	EN	European wildcats live primarily in broad-leaved and mixed forests. They avoid intensively cultivated areas and settlements. It is unlikely that this species is found within the buffer of the Plaiul Fagului Reserve.	The direct killing of any animal during construction shall be forbidden.
Birds	Great White Egret	LC	CR	This species inhabits all kinds of inland and coastal wetlands. Such habitats are not present in the buffer of the Plaiul Fagului Reserve, for what this species is unlikely to be disturbed during construction.	Not necessary
	Black Stork	LC	CR	The waterbird Black Stork visits the reserve during the seasonal migration, and forages in water surfaces. This species is, as therefore, unlikely to be disturbed during construction in the buffer of the reserve.	Not necessary
	Mute Swan	LC	VU	The large waterbird Mute Swan visits the reserve during the seasonal migration, and forages in grassland and agricultural land nearby water features. It is unlikely that swans are found within the buffer zone of the Plaiul Fagului reserve, as no large lakes or streams exist.	Not necessary
	Ferruginous Duck	NT	--	Specimens of Ferruginous Duck may also be present around the small stream in the buffer of the	As part of the Aquatic Life Survey (see Section 8.1.2.3 below), a visual inspection of the area of the small stream in the protection buffer of the Plaiul Fagului reserve shall

Class	Species	IUCN Red List classification	Moldova Red Data Book classification	Presence at site	Measures
				Plaiul Fagului reserve. The breeding season for this species begins earliest in May and ends in the end of June. Given the actual state of knowledge about the project area, the presence of Ferruginous Duck in the protection buffer of the Plaiul Fagului reserve is pointed as a possibility instead of a certainty. For this reason, a restriction on the timing of the construction (which is normally the adopted mitigation measure to eliminate impacts in these cases) cannot be plenty justified and is not suggested at this moment.	be undertaken to detect the presence of specimens of Ferruginous Duck. Although this species may in some cases remain on the breeding ground the whole year round, this inspection shall be preferably undertaken between the months of May and June to detect the eventual presence of this species in the vicinity of the pipeline route.  If the presence of Ferruginous Ducks is confirmed, the crossing of the stream shall not be undertaken during the breeding season, as this may lead to the destruction of nests and eggs which are normally laid on the ground around water features.
	Hen Harrier	LC	CR	This bird of prey visits the reserve during the seasonal migration, and it does not nest within the reserve. As therefore, the presence of this species within the buffer of the reserve is deemed unlikely.	Not necessary
	Montagu's Harrier	LC	CR	The presence of the species within the reserve is confirmed, although the status of stay (migratory, wintering, nesting) is unclear. The Montagu's Harrier is highly susceptible to disturbance, and as therefore it is not likely that specimens are found within the buffer of the reserve, which is presently urbanized with settlements, agricultural areas, roads and orchards.	Not necessary
	Greater Spotted Eagle	VU	--	The Greater Spotted Eagle is intolerant to the permanent	Not necessary

Class	Species	IUCN Red List classification	Moldova Red Data Book classification	Presence at site	Measures
				human presence on its territory, for what it is unlikely that this species is found within the buffer of the reserve Plaiul Fagului, currently disturbed with human activities (agriculture, gardens, orchards, vineyards, living areas).	
	Golden Eagle	LC	CR	<p>This species occupies a wide range of flat or mountainous, largely open habitats, often above the tree line. This species uses the Plaiul Fagului reserve as a place for migratory passage.</p> <p>Nesting occurs on cliff ledges and where these are not available, in large trees or similar artificial structures. According to data available, this species does not nest in the reserve.</p>	Not necessary
	Booted Eagle	LC	CR	<p>This is a species that nests within the reserve, for what there is a possibility that nests exists in the buffer zone. Nests are built in trees.</p> <p>It is a species of open woodland, preferring patches of forest interspersed with open areas. A mixture of woodland and open areas such as agricultural fields is optimal for this species.</p>	<div>A Bird Survey shall be undertaken.</div> <p>The main objective of the Bird Survey will be determining the presence of any protected bird species in the protection buffer of the Plaiul Fagului reserve. This can be done by verifying the presence of nests which could be used by the protected species.</p> <p>The scope of the Bird Survey shall be determined by a biologist specialized in avifauna, preferably with previous</p>

Class	Species	IUCN Red List classification	Moldova Red Data Book classification	Presence at site	Measures
	Red-footed Falcon	NT	--	The Red-footed Falcon uses tops of trees for nesting, making use of existing nests especially from rooks (rookeries). This is a species that nests within the reserve, for what there is a possibility that nests exists in the buffer zone.	knowledge about the project area. This inspection shall be preferably undertaken in Spring and early Summer, but the scope shall further clarify during which time of the year the survey shall be undertaken. The biologist shall use this ESIA as a basis for the planning of her/his work.
	European Honeybuzzard	LC	EN	This species builds its nests in woods, preferably in deciduous forest. It is registered as a nesting species within the Plaiul Fagului reserve. Because there are trees within the buffer of the reserve, there is a possibility that nests of European Honeybuzzard are encountered during construction in this area.	If the presence of specimens of <u>protected birds of pray</u> is suspected or confirmed, the felling of trees with nests in this area shall be avoided by deviating the pipeline route. If it is not possible to avoid the felling of trees with nests, the nests shall be relocated to nearby trees in order for the eagles to keep close to their usual feeding area, which is what they normally return to every year.
	Short-toed Snakeeagle	LC	CR	The presence of the species within the reserve is confirmed, although the status of stay (migratory, wintering, nesting) is unclear. This is a species which nests in trees, for what its presence in the buffer of the reserve cannot be excluded.	Any works in the proximity to trees bearing nests shall not be undertaken during the breeding season (Spring and early Summer) to avoid the destruction of eggs and juveniles.
	Lesser Spotted Eagle	LC	CR	This species nests within the reserve and it preferably breeds close to forest edges. There is, as therefore, a probability that nests are found within the buffer of the Plaiul Fagului reserve.	If the presence of <u>Shorteared Owl</u> is confirmed, the crossing of the buffer shall not be undertaken during the breeding season, as this may lead to the destruction of nests and eggs.

Class	Species	IUCN Red List classification	Moldova Red Data Book classification	Presence at site	Measures
	Shorteared Owl	LC	EN	<p>The short-eared owl is present at the reserve Plaiul Fagului, but the status of presence (migratory, nesting, or wintering) is unclear.</p> <p>This species found in open country and grasslands. It nests on the ground in prairie, tundra, savanna, or meadow habitats. The possibility that specimens are found in the buffer of the reserve cannot be at present excluded.</p>	
	Stock Dove	LC	EN	<p>The nest is usually in a hole in an old tree, mostly oak or pine trees. The habitat of the stock dove is generally open country. Even though it nests in trees it does not prefer densely wooded areas.</p> <p>This species uses the Plaiul Fagului reserve as a place for migratory passage, and as therefore no nesting habitats are expected.</p>	Not necessary
Amphibians	European Pond Turtle	NT	--	<p>The European Pond Turtle may be found in a variety of semi-aquatic environments, including streams and drainage channels of agricultural lands, both present in the protected buffer of the Plaguil Fagului reserve. During Winter, the turtle hibernates normally on land adjacent to the water features where it lives and reproduces (immediately after the hibernation period). The clearing</p>	<p>As part of the Aquatic Life Survey, a visual inspection of the area of the small stream, the drainage channels and the irrigation channels in the protection buffer of the Plaiul Fagului reserve shall be undertaken to detect the presence of specimens of European Pond Turtle.</p> <p>In case the presence of this species is confirmed, the crossing of the stream and any eventually existing irrigation and drainage channels in the protection buffer of the Plaiul Fagului reserve shall not be undertaken during Winter, when the European Pond Turtle may be wintering underground close to these surface waters.</p>



Class	Species	IUCN Red List classification	Moldova Red Data Book classification	Presence at site	Measures
				of the ROW in the vicinity of the stream and irrigation channels within the protection buffer of the Plaiul Fagului reserve during Winter may kill some specimens of the European Pond Turtle.	
Insects	Praying mantis	--	EN	Praying mantis can be found in any kind of habitat, but prefer long grass areas, grasslands and meadow lands. These habitats can be found within the buffer of the Plaiul Fagului reserve.  Just one blanket application of chemical pesticides can eliminate the whole population of the area.	The clearing of the area for construction and maintenance purposes can not be undertaken with chemical pesticides.
	Forest caterpillar hunter	--	CR	Beetles take shelter in old trees and their larvae feed on the old and decaying wood. Within the protection buffer of the Plaiul Fagului reserve some trees could be affected by the pipeline. It is not clear at the present if these trees could constitute a shelter for these protected species.	A Trees Survey shall be undertaken.
	<i>Porthmidius austriacus</i>	--	CR		The Trees Survey shall cover the protective buffer of the Plaiul Fagului reserve crossed by the pipeline to:  visually evaluate the age of the trees; detect the presence of nests of carpenter bees  The Trees Survey shall be undertaken by a specialized biologist, preferably with previous knowledge about the project area. The biologist shall use this ESIA as a basis for the planning of her/his work.  Do not destroy fallen and decaying old trees in the RoW of the pipeline. Remove dead trees to undisturbed places in the vicinity, preferably to the edge of the reserve.
	European rhinoceros beetle	--	EN		
	Stag beetle	--	EN		
	Capricorn beetle	VU	EN		
	Morimus funereus	VU	EN		
	Rosalia longicorn	VU	CR		
	Blue Ground Beetle	NT	--		
	Carpenter bee	--	EN	Carpenter bees nest inside the wood of trees with perfectly round entrances. It is not clear at the present if trees within the protective buffer of the reserve	In case old trees (especially oak trees) or trees bearing carpenter bees nests are found within the pipeline route, deviate it in such a way to avoid the fell of these trees within the buffer of the reserve Plaiul Fagului.

Class	Species	IUCN Red List classification	Moldova Red Data Book classification	Presence at site	Measures
				could constitute a shelter for these protected species.	
	Giant peacock moth	--	EN	<p>This nocturnal species inhabits open landscapes with scattered trees and shrubs. Oakland, orchards and vineyards with shade trees are particularly favoured. Caterpillars are polyphagous and can eat leaves of many different tree species such as plum, apple, blackthorn, ash, walnut, poplar etc.</p> <p>Given the above, there is a possibility that specimens of this species are found within the buffer zone of the Plaiul Fagului reserve.</p>	The detail design shall avoid the need to cut down isolated oak trees, i.e., oak trees located in open areas.
	Oak Hawk-moth	--	EN	The eggs are laid in solitary oaks and the larvae feed on small oak bushes. Given this, there is a possibility that specimens of this species are found within the buffer zone of the Plaiul Fagului reserve.	
	Jersey Tiger (moth)	--	VU	<p>The Jersey Tiger moth inhabits evergreen riparian forests, gardens and woodland edges. It eats and lays its eggs on different plant species, some of which exist within the Plaiul Fagului reserve: stinging nettle (<i>Urtica dioica</i>), dead nettle (<i>Lamium purpureum</i>), blue weed (<i>Echium vulgare</i>), and raspberry (<i>Rubus ideaus</i>).</p> <p>There is a possibility that specimens of these plant species</p>	As part of the restoration works, the disturbed land shall be re-seeded with the plant species that occupied the project area before clearing (except for trees and bushes).

Class	Species	IUCN Red List classification	Moldova Red Data Book classification	Presence at site	Measures
				(and, as therefore, of Jersey Tiger moth) are found within the buffer zone of the Plaiul Fagului reserve.	<p>The contractor shall assure that stripped topsoil from pasture land is not mixed with stripped topsoil from agricultural land. This will avoid a nutrient mixture which could be disadvantageous for the plants of the family Umbelliferae, of which the protected Old World and Scarce Swallowtail depend.</p>
	Scarce Swallowtail	--	VU	<p>This species is found in gardens, fields and open woodlands, places with sloe thickets and particularly orchards. It lays its eggs on pine trees. It feeds on hawthorn trees and plants of the family Umbelliferae, commonly known as the celery, carrot or parsley family.</p> <p>Plants from the family Umbelliferae are mostly found in pastures and grassland areas, but also gardens, which exist within the buffer of the Plaiul Fagului reserve.</p> <p>Pine trees and hawthorn trees are not expected to be found within the buffer.</p>	
	Old World Swallowtail	--	CR	<p>This species mostly feeds on plants of the family Umbelliferae, commonly known as the celery, carrot or parsley family. These plant species are mostly found in pastures and grassland areas, but also gardens, which exist within the buffer of the Plaiul Fagului reserve.</p>	
Plants	Common ladyfern	--	VU	<p>These species exist within the Plaiul Fagului reserve. As therefore, there is a possibility that these are found also in the protective buffer.</p>	<p>As part of the restoration works, the disturbed land shall be re-seeded with the plant species that occupied the project area before clearing (except for trees and bushes).</p>
	White Helleborine	--	VU		
	Sword-leaved	--	VU		

Class	Species	IUCN Red List classification	Moldova Red Data Book classification	Presence at site	Measures
	Red Helleborine	LC	CR		
	Perennial bunchgrass	--	VU		
	lady's slipper orchid	LC	CR		
	Heart Shaped Lip Dactylorhiza	LC	CR		
	February daphne	--	CR		
	<i>Cardamine glanduligera</i>	--	VU		
	<i>Quinquefolia Bieb.</i>	--	EN		
	Hungarian Doronicum	--	VU		
	Narrow bucklerfern	--	EN		
	Violet Helleborine	LC	VU		
	Turkestan Burning Bush	--	VU		
	Common Snowdrop	NT	VU		
	Common winged broom	LC	CR		
	Western Oakfern	--	CR		
	Dutchman's pipe	--	CR		
	Perennial honesty	--	EN		
	May lily	--	CR		
	Bog orchid	LC	EN		
	Lady orchid	--	EN		
	Bird cherry	--	EN		

Class	Species	IUCN Red List classification	Moldova Red Data Book classification	Presence at site	Measures
	Hard Shield Fern	--	EN		
	European scopolia	--	VU		
	Service tree	--	EN		
	Marsh fern	LC	EN		
<b><u>Seliște-Leu (Option 2):</u></b>					
Mammals	Wild Cat	LC	EN	This species has been listed as living within the reserve Seliște-Leu	The direct killing of any animal during construction shall be forbidden.
Amphibians and Reptiles	Smooth Snake	--	EN	This species has been listed as living within the reserve Seliște-Leu	The direct killing of any animal during construction shall be forbidden.
	Northern Viper	--	EN	This species has been listed as living within the reserve Seliște-Leu	The direct killing of any animal during construction shall be forbidden.
Insects	European rhinoceros beetle	--	EN	Beetles take shelter in old trees and their larvae feed on the old and decaying wood.	Undertake a visual evaluation of the age of the trees. In case old trees are found within the pipeline route, deviate it in such a way to avoid the fell of old trees.
	Stag beetle	--	EN	This species has been listed as living within the reserve Seliște-Leu.	Do not destroy fallen and decaying old trees in the RoW of the pipeline. Remove dead trees to undisturbed places in the vicinity, preferably to the edge of the reserve.
	Giant peacock moth	--	EN	<p>This nocturnal species inhabits open landscapes with scattered trees and shrubs. Oakland, orchards and vineyards with shade trees are particularly favoured. Caterpillars are polyphagous and can eat leaves of many different tree species such as plum, apple, blackthorn, ash, walnut, poplar etc.</p> <p>This species has been listed as living within the reserve Seliște-</p>	The detail design shall avoid the need to cut down isolated oak trees, i.e., oak trees located in open areas.

Class	Species	IUCN Red List classification	Moldova Red Data Book classification	Presence at site	Measures
				Leu.	
	Scarce Swallowtail	--	VU	<p>This species is found in gardens, fields and open woodlands, places with sloe thickets and particularly orchards. It lays its eggs on pine trees. It feeds on hawthorn trees and plants of the family Umbelliferae, commonly known as the celery, carrot or parsley family.</p> <p>This species has been listed as living within the reserve Seliște-Leu.</p>	The detailed design shall avoid the need to cut down pine and hawthorn trees inside the reserve.
Plants	Snake's head	--	+	This species has been listed as existing within the reserve Seliște-Leu.	As part of the restoration works, the disturbed land shall be re-seeded with the plant species that occupied the project area before clearing (except for trees and bushes).

### **Classification of impacts**

The classification of impacts on the protected areas from the construction phase can be consulted in Table 8-21 for both options.

Considering the application of the mitigation measures as described in this section, the residual impacts in the buffer of the reserve Plaiul Fagului (Option 1b) could be significantly reduced. In case of Option 2, the passage through the forest reserve Seliște-Leu would imply the feel of protected trees. Option 2 could imply the non-fulfilment of the protection objectives of the reserve Seliște-Leu.

**Table 8-21: Classification of the impacts on protected areas - construction phase**

<b>Impacts on protected areas - Construction phase</b>		
<b>Factors</b>	<b>Option 1b</b>	<b>Option 2</b>
Scale	Local	Local
Duration	Temporary, short term	Temporary, short term
	Permanent	Permanent
Severity (comparative) *	Medium	High
Certainty	Definitive	Definitive
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	Yes	Seliște-LeuYes
Specialist study?	No	
<b>Significance</b>	Medium	High
<b>Mitigation measures applicable?</b>	Yes	
<b>Compensation measures applicable?</b>	No	
<b>Significance of the residual impacts</b>	Low	Medium

\* The severity is assessed in a comparative way and depends on the area of crossed protected areas and their ecological richness/sensitivity for each option

#### **8.1.2.2 Ecological corridors**

One planned national ecological corridor (part of the National Ecological Network) is crossed by Options 1b and 2 (Map 3 in Annex 15.6). This corridor is important for the migration of animal and plant species between the NEN core areas Plaiul Fagului and Codrii (Section 7.2.2). Annex 16.1 shows the protected species that live within both these reserves and that could use this corridor to travel between them.

During the construction activities the ecological corridor will be blocked due to the presence of workers, machinery and the trenches. This implies a temporary disturbance (a few weeks) to the movement of animal and plant species. Animals circulating between the two reserves could fall inside open trenches if these are not secured. The two reserves contain small animals like shrews, several rodents and lizards, but also larger animals like deers.

According to Map 3 in Annex 16.7, the points where the routing options cross the ecological corridor are non-forested. This means that after construction the surface of the affected corridor area will return to its original state.

### **Mitigation**

During construction, the following measures shall be applied:

To prevent animals from falling into open trenches, wildlife escape ramps from open trenches shall be installed initially every 1 km where crossing the corridor. A walk-through shall be undertaken everyday and any trapped animals shall be carefully released. If the daily walk-through reveals that animals get regularly trapped inside the trenches and cannot escape due to the relatively large distance between escape ramps (like registered by Doody *et al*, 2003 for the case of small animals), these shall be placed every 500 meters.

- The escape ramps shall be built along the trench in the way depicted in Figure 8-5 in the previous Section, i.e, parallel to the trench line.
- Limit the length of open trench to 10-12 km at any given time. This shall be made not only when constructing nearby reserves, but as a general measure along the entire construction site.

### **Classification of impacts**

The classification of impacts on the ecological corridors from the construction phase can be consulted in Table 8-22 for both options.

**Table 8-22: Classification of the impacts on the ecological corridors - construction phase**

<b>Impacts on the ecological corridors - Construction phase</b>		
<b>Factors</b>	<b>Option 1b</b>	<b>Option 2</b>
Scale	Local	Local
Duration	Temporary, short term	Temporary, short term
Severity	Low	Low
Certainty	Possible	Possible
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	No	No
Specialist study?	No	
<b>Significance</b>	Low	Low
<b>Mitigation measures applicable?</b>	Yes	
<b>Compensation measures applicable</b>	No	
<b>Significance of the residual impacts</b>	Low	Low



### 8.1.2.3 Other fauna

Generally, the fauna present in an area where construction activities take place is subject to the following impacts:

- Direct killing and injuring due to removal of the vegetation and the soil, movements and works of heavy vehicles and machinery;
- Disturbance due to noise and vibrations;
- Optical disturbances (movement of workers and construction vehicles, light pollution at night);
- Destruction of habitats and nests due to cutting of trees and bushes, circulation of heavy vehicles and machinery, and soil clearance;
- Injuries or direct killing due to falls into open trenches;
- Disruption of aquatic life, e.g. fish spawning activities due to construction works in surface water systems.

The existence and level of significance of impacts on the fauna from the Ungheni-Chisinau project varies along the pipeline route. When crossing agricultural and residential areas, less significant impacts on the local fauna are expected, as these areas are less rich in animals than forests or water bodies. The evaluation of the impacts on fauna within the reserves and NEN core areas is made in Section 8.1.2.1 - Natural protected areas.

By considering the number of water crossings, the area and length of impact on water features and the forest impact area within the 50 meter wide safety strip, it has been determined which of the routes implies a larger impact on the fauna. The results can be consulted in Table 8-23 (for aquatic fauna) and Table 8-24 (for terrestrial fauna).

**Table 8-23: Impacts on the natural environment during construction - aquatic fauna - number of crossings and affected area and length**

Option	Impacts on aquatic fauna			
	Number of crossings		Impacts due to discharge, run-off and hydrostatic testing	
	Rivers	Lakes, wetlands and reservoirs	Lakes, wetlands and reservoirs: Possible Impact area [ha]	Rivers: Possible Impact length [km]
1b	24	1	138.23	61.96
2	32	1	81.82	63.57

The results show that Option 2 implies a larger number of crossings (32% more), but a smaller area of possibly affected lakes/reservoirs/wetlands than Option 1b (41% less). The extent of possibly impacted rivers is almost the same for both options. Distinguishing the significance of impacts on aquatic fauna between the two options is as therefore not possible.

**Table 8-24: Impacts on the natural environment during construction - terrestrial fauna - impact area**

Option	Impacts on terrestrial fauna
	Impacted forested areas (non-protected) [ha]
1b	39.04
2	23.34

The results show that Option 1b implies a larger area of impacted forest, implying a larger area of possibly impacted terrestrial fauna. **Mitigation**

To avoid impacts on the aquatic and terrestrial fauna, during the pre-feasibility study and the scoping phase route options have been chosen that minimize the passage through forests and water bodies. The chosen route options have been additionally optimized with the same objective (please refer to Section 6 for detailed information). The construction contractor shall, during the detailed design phase continue optimizing the route in such a way to avoid passage through or proximity to these areas. Any micro-realignment of the pipeline route, or construction of associated facilities outside the 1,000 meters width investigation area, as well as any deviation or construction that implies entering protected areas or forcing the re-location of buildings, shall be subject to the lenders' prior information and approval.

Considering the relatively large number of water crossings, it is necessary to obtain more detailed information about the aquatic species that live in or in the surroundings of the surface water features in the area.

An Aquatic Life Survey shall be undertaken by the Project Owner(MoE).

The main objectives of the Aquatic Life Survey will be:

- Determining the presence of any protected species of fish, birds, mammals, amphibians, reptiles, or insects within the water courses to be crossed;
- determining fish spawning, feeding, over-wintering or nursery areas;
- with the information obtained as per the above, determine the sensitivities of the water courses to be crossed, and support thereof the development of the Water Crossings Management Plan with temporal and spatial avoidance measures, as well as mitigation measures for each crossing location.

The scope of the Aquatic Life Survey shall be determined by a biologist specialized in fresh water animals, preferably with previous knowledge about the project area. The scope shall clarify which water courses shall be included, and during which time of the year the survey shall be undertaken. In principle the survey shall be undertaken in Spring/Summer time (between March and September), but this shall be confirmed by the biologist. The biologist shall use this ESIA as a basis for the planning of her/his work.

During construction, the following measures shall be applied:

- The construction activities shall be limited to the defined construction corridor and vehicle movements and storage of construction material outside of this corridor shall be prohibited;
- Hunting shall be prohibited for all workers;
- Select crossing locations where aquatic vegetation is scarce or absent;
- For avoidance and mitigation of impacts on fish:
  - No crossing shall be planned to areas where sensitive habitats and fish spawning, feeding, over-wintering or nursery areas exist (as a result of the Aquatic Life Survey);
  - If the Aquatic Life Survey detects species which are highly sensitive to release of sediments into the water, no wet crossing shall be undertaken up to 1 km upstream of the areas of such species. In such cases, either the crossing is undertaken on another location or a dry ditch method shall be used.

### **Classification of impacts**

The classification of impacts on other fauna from the construction phase can be consulted in for both options

**Table 8-25: Classification of the impacts on fauna - construction phase**

<b>Impacts on other fauna - Construction phase</b>		
<b>Factors</b>	<b>Option 1b</b>	<b>Option 2</b>
Scale	Local	Local
Duration	Temporary, short term	Temporary, short term
Severity (comparative) *	High	Medium
Certainty	Possible	Possible
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	No	No
Specialist study?	No	
<b>Significance</b>	High	Medium
<b>Mitigation measures applicable?</b>	Yes	
<b>Compensation measures applicable?</b>	No	
<b>Significance of the residual impacts</b>	Medium	Low

\* The severity is assessed in a comparative way and depends on the area of crossed forests (excl. protected areas) for each option

#### **8.1.2.4 Other flora**

The impacts on flora are accounted in this section when they relate to losses of or damages to forest trees (outside protected areas), as well as losses or damages to riparian vegetation. The losses of trees will be permanent (no

tree is allowed within the safety strip), but the riparian vegetation can be replanted.

For the context of the present ESIA, losses of orchards, vineyards and other crops are not going to be accounted as impacts on flora, but instead as economic impacts (please refer to Section 8.1.3.1). Economic plants do not normally have a significant ecological importance.

The evaluation of the impacts on flora within the reserves and NEN core areas is made in Section 8.1.2.1 - Natural protected areas.

By considering the number of water crossings and the forest impact area within the 50 meter wide safety strip, it has been determined which of the routes implies a larger impact in the riparian and terrestrial flora. The results can be consulted in Table 8-26 and Table 8-27.

**Table 8-26: Impacts on the natural environment during construction - riparian flora - number of crossings**

Option	Number of crossings	
	Rivers	Lakes, wetlands and reservoirs
1b	24	1
2	32	1

The results show that Option 2 implies a larger number of water crossings than Option 1b (32% more). This means that more riparian vegetation will need to be removed and disturbed than in the case of construction of Option 1b.

**Table 8-27: Impacts on the natural environment during construction - terrestrial flora - impact area**

Option	Impacted forested areas (non-protected) [ha]
1b	39.04
2	23.34

The results show that Option 1b crosses a larger area of forest, implying the permanent loss of more trees than Option 2.

It is evaluated that Option 1b implies more significant impacts on the flora than Option 2. This is because Option 1b implies a larger area of permanent impacts (as a result of tree clearing - ). Although Option 2 implies a larger number of water crossings (), the impacts on the riparian flora derived thereof are reversible.

## **Mitigation**

To avoid impacts on the flora, during the pre-feasibility study and the scoping phase route options have been chosen that minimize the passage through forests and water bodies (to avoid impacts on the terrestrial and riparian flora, respectively). The chosen route options have been additionally optimized with the same objective (please refer to Section 6 for detailed information). The construction contractor shall, during the detailed design phase continue optimizing the route in such a way to avoid passage through or proximity to these areas. Any micro-realignment of the pipeline route, or construction of associated facilities outside the 1,000 meters width investigation area, as well as any deviation or construction that implies entering protected areas or forcing the re-location of buildings, shall be subject to the lenders' prior information and approval.

During construction (clearing), the following measures shall be applied:

- Restrict the felling of trees and removal of riparian vegetation to the minimum required, i.e., trees can only be felled within the safety corridor and on the alignment of approved access roads;
- All trees shall be felled toward the construction strip to minimize damage to trees in adjacent areas;
- Do not allow the circulation of vehicles, machinery and workers outside the construction strip and access roads, with the exception of vehicles involved in clearance which are allowed in the safety strip during clearing;
- Give the cleared materials to the local inhabitants, if they so desire; in case there is no interest from the community, save the materials for disposal.
- For mitigation and restoration measures for riparian vegetation, please refer to Section 8.1.1.3.

## **Classification of impacts**

The classification of impacts on flora from the construction phase can be consulted in Table 8-28 for both options.

**Table 8-28: Classification of the impacts on flora - construction phase**

Impacts on flora (forest trees and riparian vegetation) - Construction phase		
Factors	Option 1b	Option 2
Scale	Local	Local
Duration	For forest trees - permanent  For riparian vegetation - Temporary, short term	For forest trees - permanent  For riparian vegetation - Temporary, short term
Severity (comparative) *	High	Medium
Certainty	Definitive	Definitive

Impacts on flora (forest trees and riparian vegetation) - Construction phase		
Factors	Option 1b	Option 2
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	No	No
Specialist study?	No	
Significance	High	Medium
Mitigation measures applicable?	Yes	
Compensation measures applicable	No	
Significance of the residual impacts	Medium	Low

\* The severity is assessed in a comparative way and depends on the number of water bodies crossed and the area of crossed forests (excl. protected areas) for each option

### 8.1.3 Impacts on the Human Environment

The evaluation of socio-economic impacts often requires a considerable degree of subjective professional judgment, based on local context and previous project experience. This is primarily because data on potential socio-economic impacts consists not only of facts but also of individual and community perceptions and attitudes, often meaning that the impact will vary according to the individuals or communities involved.

The data that have been collected in the socio-economic survey (Section 7.3) provide evidence and support for this evaluation, but do not allow impacts to be fully quantified or their importance to be assessed or ranked numerically in all cases. In such situations, the determination and classification of the impacts is based on professional judgment of the likelihood and consequence of the impact.

This sub-section assesses the impacts that the project's construction will potentially have on the different socio-economic and land use receptors/resources which were identified in the social baseline assessment.

Land owners without a formal land title but with a valid claim to it are likely to be present in the project area. After the Soviet Union has been dismantled, the people received the land they have been working on. However, due to reasons still not clear, some of these owners never received or applied for a formal land title. It is possible in Moldova for an informal owner with a legitim claim to the land to obtain a title. She or he shall for this purpose register their land. The register may take 3 to 6 months to be completed and needs to be ready for budgeting of the compensation costs of the project. If the register is successful, these land owners are entitled to compensation for land and assets.

Land owners without a formal land title and without a recognizable claim to it (squatters) are entitled, following the international requirements of the financing institutions, to receive compensation for any assets lost, with the exception of land.

The existence of the both cases above described was not confirmed nor rejected during the socio-economic survey. During the detailed design and the survey of PAPs this shall be clarified, and compensation shall be paid in accordance.

No other vulnerable groups were identified during the baseline survey.

#### 8.1.3.1 Land and property

This section only accounts for the impacts on private land and private property.

For the project it was considered that the construction activities imply a strip with a width of 16 meters where opening of trenches and deposition of some materials is made, as well as construction vehicles circulate. The construction strip will be temporarily cleared of any vegetation (no buildings exist within the construction strip) before the works begin.

Within the project area, several different types of vegetation exist, as previously described in Section 7.3.6:

- Ephemeral agricultural crops: vegetables and cereals;
- Perennial agricultural crops: orchards and vineyards;
- Pastures;
- Forest: protected and non-protected.

The impacts of clearing within the construction strip will be temporary for vegetation with short roots, like vegetables, cereals and pastures. For forest trees, orchards and vineyards the impacts will be permanent, as none of these typologies of plants can be re-grown above the pipeline.

The losses of forest trees, orchards and vineyards will be felt not only in the construction strip, but also on the safety strip, or right of way (ROW). The safety strip is expected to have a total width of 50 meters.

Normally in Moldova the forest land is state property and this has been assumed in the ESIA. For this reason, no impacts on land and property related to the losses of forest trees are accounted for.

By considering a construction strip of 16 meters of width and a safety strip of 50 meters of width, it has been determined which of the routes implies a larger impact area on land and property. The compensation costs are also shown. The methodology for calculation of the costs is explained in detail in Section 12 of this ESIA. The results can be consulted in Table 8-29.

**Table 8-29: Impacts on the human environment - land and property (crops) - affected area and compensation costs**

Option	Land use	Area affected [ha]	Compensation costs [MDL] *
1b	Ephemeral agricultural fields	116.04	1,041,385
	Orchards	46.24	27,744,000
	Vineyards	38.38	11,319,030
	<b>TOTAL</b>	<b>200.66</b>	<b>40,104,414</b>
2	Ephemeral agricultural fields	144.30	1,295,000
	Orchards	24.81	14,886,000
	Vineyards	46.32	13,660,694
	<b>TOTAL</b>	<b>215.43</b>	<b>29,841,694</b>

\* The methodology for calculation of compensation costs is described in Section 12 of this ESIA

The data show that Option 2 implies a larger area of property that needs to be removed for the establishment of the construction and safety strips (215.43 ha compared to 200.66 ha of Option 1b). However, the compensation costs are lower than those for Option 1b (ca. 30 million MDL compared to ca. 40 million MDL of Option 1b). This is because Option 2 crosses less orchards and vineyards, for which compensation costs are higher than for pasture land. Please consult Section 12 of this ESIA to understand the methodology for cost calculation.

Works on pasture lands may create difficulties for the livestock from grazing areas. Construction works will restrict this kind of activities which will result in potential adverse impacts on the livelihoods of affected persons. These impacts will be of higher significance for Option 2 because a larger area of pastures will be disturbed during construction, as shown in Table 8-30. A calculation of the compensation costs for loss of access to pasture land is not included, as this is not predicted in the national law. Mitigation measures are, however, predicted (please see below).

**Table 8-30: Impacts on the human environment - land and property (temporary disturbances to pastures) - affected area**

Option	Land use	Area affected temporarily during construction [ha]
1b	Pasture land	19.83
2	Pasture land	24.30

The location of the above ground facilities (pigging stations, GPRSs and block valve stations) is not known at this point. The land requirements are expected to be as follows:



- Private pasture land: 0.07 ha (0.05 ha for 5 block valve stations + 0.02 ha for 2 isolated pigging stations).
- State owned land: 3.08 ha (for 2 GRPRs including 3 pigging stations).

Table 8-31 shows the costs expected for the acquisition of private land for the above ground facilities. State owned land does not need to be acquired. The compensation are the same for both project options, as the same type of land (pastures) is expected to be affected.

**Table 8-31: Impacts on the human environment - land and property (land acquisition) - affected area**

Option	Land use	Area to be acquired for above ground facilities [ha]	Compensation costs [MDL] *
1b	Pasture land	0.07 ha	5,651.46
2	Pasture land	0.07 ha	5,651.46

\* The methodology for calculation of compensation costs is described in Section 12 of this ESIA

The location and dimensions of the workers camps and access roads is not known at present, for what the compensation costs cannot be predicted.

Given the high land fragmentation in the area, i.e., the small size of the individual plots (Section 7.3.2 of this ESIA), it is possible that the clearing of vineyards or orchards on a specific parcel of land will render the whole small plot useless. In such cases, even if compensation is provided for the parcel of land allocated for the project, the remaining small parcel of land may not be able to continue providing the land owner with a source of income.

### **Mitigation**

During the detailed design phase, the Construction Contractor shall refine the route in such a way to further avoid the impacts on land and property. This implies in particular to avoid affecting the small land plots in such a way that these will be rendered useless after the works, i.e., significant portions of each plot shall not be affected.

Any micro-realignment of the pipeline route, or construction of associated facilities outside the 1,000 meters width investigation area, as well as any deviation or construction that implies entering protected areas or forcing the re-location of buildings, shall be subject to the lenders' prior information and approval.

During the detailed design phase, the MoE (Project Owner) shall conduct specific site surveys to collect information on the exact affected areas, respective owners (or project affected people, PAP), and determine the compensation mechanisms and costs. This Survey of PAPs shall be part of a detailed resettlement instrument (more details on Section 12 of this ESIA).

It is essential to properly inform and consult with the affected landowners about the compensation measures. The PAPs shall agree with the decisions taken before construction begins.

To reduce the impacts on land and property during construction:

- the works shall be strictly restricted to the construction strip;
- do not allow the circulation of vehicles, machinery and workers outside the designated areas;
- measures to avoid soil erosion, mixing, rutting, compaction and pollution shall be applied (see Section 8.1.1);
- restoration of the temporary affected land to its preconstruction conditions;
- all trees shall be felled toward the construction strip to minimize damage to trees in adjacent areas;
- the construction works on pasture land shall not be undertaken during the grazing season, if the affected area is deemed to impede the pasture activities. This shall be discussed and agreed with the landowners previously.

### **Compensation**

In relation to private property, compensation mechanisms are predicted for the temporary losses of agricultural crops, for the permanent losses of orchards and vineyards, and for permanent losses of land. These have been calculated in this sub-section (Tables 8-29, 8-30 and 8-31).

Compensation for losses of land and agricultural assets is predicted for formal land owners, as well as for informal land owners with a recognizable claim to the land. Compensation for losses of agricultural assets (but not for land) is predicted for informal land owners without a recognizable claim to the land. For further details, please refer to Section 12 of this ESIA - Resettlement Policy Framework.

In relation to public property (forest trees, protected and non-protected), no compensation is due.

### **Classification of impacts**

The classification of impacts on land and property from the construction phase can be consulted in Table 8-32 for both options.

**Table 8-32: Classification of the impacts on land and property - construction phase**

Impacts on land and property - Construction phase		
Factors	Option 1b	Option 2
Scale	Local	Local
Duration	Temporary, short term for ephemeral crops	Temporary, short term for ephemeral crops
	Permanent for perennial crops and land	Permanent for perennial crops and land
Severity (comparative) *	Very High	High
Certainty	Definite	Definite
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	No	No
Specialist study?	Yes (Pre-construction detailed survey of PAP and determination of land and compensation costs)	
<b>Significance</b>	Very high	High
<b>Mitigation measures applicable?</b>	Yes	
<b>Compensation measures applicable?</b>	Yes	
<b>Significance of the residual impacts</b>	Medium	Medium

\* The severity is assessed in a comparative way and depends on the area and type of land and property affected for each option

### 8.1.3.2 Access

The impact on access during construction works is mainly related to reduced mobility. The construction works may temporarily affect the use of the roads, constrain the access to properties and can increase the travel time for farmers, local business and general public.

#### Mitigation

The Construction Contractor shall elaborate a Traffic Management Plan (TMP).

The Traffic Management Plan shall include:

- providing temporary access alternatives;
- providing community information related to the construction schedule on particular section of roads that are expected to be affected by the works;
- a mechanism for liaison with the local traffic management authorities.

The workers camps shall be placed close to the pipeline ROW. This will minimize travel on the public roads while maximizing the usage of the ROW to circulate.

### **Classification of impacts**

The classification of impacts on access during the construction phase can be consulted in Table 8-33 for both options.

**Table 8-33: Classification of the impacts on access - construction phase**

<b>Impacts on access - Construction phase</b>		
<b>Factors</b>	<b>Option 1b</b>	<b>Option 2</b>
Scale	Local	Local
Duration	Temporary, short term	Temporary, short term
Severity	Low	Low
Certainty	Possible	Possible
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	No	No
Specialist study?	No	
<b>Significance</b>	Low	Low
<b>Mitigation measures applicable?</b>	Yes	
<b>Compensation measures applicable?</b>	No	
<b>Significance of the residual impacts</b>	Low	Low

#### **8.1.3.3 Utilities**

Public utilities which are located under and above ground such as water supply, sewerage, cable network, telephone and power supply can be damaged during construction. This could lead to community complaints, penalties and delays.

### **Mitigation**

Prior to construction works a detailed survey shall done by the Construction Contractor to identify the utilities along the pipeline route.

Prior to start the works, the Contractor shall inform the service provider that the works will occur on a certain portion of the pipeline. In some cases, a representative of the service provider shall be present on site during the works.

### **Classification of impacts**

The classification of impacts on utilities during the construction phase can be consulted in Table 8-34 for both options.

**Table 8-34: Classification of the impacts on utilities - construction phase**

<b>Impacts on utilities - Construction phase</b>		
<b>Factors</b>	<b>Option 1b</b>	<b>Option 2</b>
Scale	Local	Local
Duration	Temporary, short term	Temporary, short term
Severity	Low	Low
Certainty	Possible	Possible
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	No	No
Specialist study?	Yes (Utilities survey prior to construction)	
<b>Significance</b>	Medium	Medium
<b>Mitigation measures applicable?</b>	Yes	
<b>Compensation measures applicable?</b>	No	
<b>Significance of the residual impacts</b>	Low	Low

#### 8.1.3.4 Workforce related impacts

The construction of a new pipeline and associated infrastructures may imply specific impacts on the workforce related to:

- occupational health and safety: falls, electrocution, injuries, exposure to high levels of noise and dust, exposure to toxic substances, collapse of the walls of the trenches, weather related risks (working under too low or too high temperatures), etc.;
- on and off-site conditions: waste management, hygiene, food supply, security, etc.;
- worker's rights, rules and obligations;
- employment standards.

#### **Mitigation**

In order to minimize negative impacts on the workforce, the Construction Contractor (CC) shall abide by the EIB ESS 8 (Labour Standards), the EIB ESS 9 (Occupational and Public Health, Safety and Security) and the EBRD PR 2 (Labour and Working Conditions) (Section 4.3 of this ESIA).

Following these policies implies that the CC shall:

- have a clear, understandable and accessible human resources policy;
- document and communicate to all workers their working conditions and terms of employment;

- respect the requirements of Moldova Law 186 on Occupational Safety and Health and international best practices, inclusive in the supply chain<sup>3</sup>;
- develop measures for emergency prevention, preparedness and response;
- provide and make accessible a transparent [grievance mechanism for workers](#) (and their organizations, where they exist);
- make all security arrangements compliant with the best international standards<sup>4</sup>;
- provide adequate, timely and regularly updated training and briefings for workers on safety precautions and their responsibility for their safety and the safety of others;
- require the workers to use the provided safety equipment;
- report and record any accidents, incidents and/or breach of relevant legislation arising from the project;
- assure that all workers have access to adequate, safe and hygienic basic facilities on-site, and that qualified first-aid can be provided at all times;
- assure the rapid availability of trained paramedical personnel, and emergency transport to nearest hospital with accident and emergency facilities;
- provide workers camps that respect the requirements outlined in Section 10.4 of this ESIA;
- identify the employment of migrant workers and ensure their treatment is not less favourable than that of no-migrant workers undertaking similar functions. This includes enjoyment of same rights and of equal opportunities and treatment. No physical or psychological coercion on migrant workers, including unnecessary restrictions on movement or retention of worker's identity documents or personal belongings is allowed.
- ensure that its primary contractors and first-tier suppliers uphold the same principles.

### **Classification of impacts**

The classification of impacts on occupational health and safety during the construction phase can be consulted in Table 8-35 for both options.

---

<sup>3</sup> ILO conventions related to the abolition of child and forced labour, the elimination of discrimination related to employment, the freedom of association, and collective bargaining

<sup>4</sup> The Voluntary Principles on Security and Human Rights (VPSHR), the UN Basic Principles on the Use of Force and Firearms by Law Enforcement Officials, the UN Code of Conduct for Law Enforcement Officials, and the International Code of Conduct on Private Security Providers.

**Table 8-35: Classification of the impacts on occupational health and safety - construction phase**

<b>Impacts on occupational health and safety - Construction phase</b>		
<b>Factors</b>	<b>Option 1b</b>	<b>Option 2</b>
Scale	Local	Local
Duration	Temporary, short term  May be permanent	Temporary, short term  May be permanent
Severity	Very high	Very high
Certainty	Likely	Likely
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	No	No
Specialist study?	No	
<b>Significance</b>	Very high	Very high
<b>Mitigation measures applicable?</b>	Yes	
<b>Compensation measures applicable?</b>	No	
<b>Significance of the residual impacts</b>	Medium	Medium

#### 8.1.3.5 Community Health & Safety

The construction of the gas pipeline may increase the community exposure to health, safety and security risks, such as:

- moving heaving vehicles that generate dust and noise,
- exposure to hazardous materials during construction and transport;
- accidents within the construction site (falls on open trenches, injuries or dead caused by rolling pipes, etc.);
- traffic accidents;
- misbehaviour of security forces (abuses of power, disrespect for the local inhabitants, etc.).

It is estimated that around 50 workers will be necessary in total for the construction of the pipeline, meaning that small camps shall be needed (one every 6 kms). Due to the requirements of the IFIs regarding the procurement for the project, a Europe-wide tender will be undertaken for the project. As therefore, it is expected that a both foreign and national workers will collaborate in the project's construction. The presence of non-local workforce may bring some social conflicts with the local population, especially if workers from abroad are contracted. In this case, conflicts caused by cultural differences may happen.

#### **Mitigation**

In order to minimize negative impacts on the community, the Construction Contractor (CC) shall abide by the EIB ESS 9 (Occupational and Public Health, Safety and Security) any by the EBRD PR 4 (Community Health, Safety and Security) (Section 4.3 of this ESIA).

Following these policies implies that the CC shall create an appropriate management system (HSE Plan) including:

- fence the site at the borders of the ROW when in proximity to villages, and place entrance prohibition and other warning signs;
- securely store the unused pipes;
- use blowers, vacuums or water to remove dry materials from vehicles avoiding, this way, the deposition of mud or soil on the roads;
- Limit the lenght of open trench to 10-12 km at any given time.
- engage the community and the PAPs (Project Affected Persons) by following the Public Consultation and Disclosure Plan prepared for this project (Annex 16.6);
- grant PAPs free and easy access to an independent and effective grievance mechanism, based on the one described on the PCDP;
- disclose relevant project-related information to enable the stakeholders to understand these risks and potential impacts, as well as its proposed prevention, mitigation and emergency response measures;
- prevent or minimize the potential for community exposure to hazardous materials;
- control the transport safety by means of a Traffic Management Plan (see Section 8.1.3.2) and a range of road safety programs for employees and community members targeting fatigue and safe driving;
- avoid or minimize adverse impacts due to project activities on air, soil, water, vegetation and fauna and other natural resources in use by the affected communitie;
- develop accident prevention/emergency preparedness policy and measures;
- assist and collaborate with the community and the local government agencies in their preparations to respond effectively to emergency situations;
- in case security services are contrated, assure that those providing security are not implicated in past abuses, are adequately trained, have an appropriate conduct towards the citizens and other workers, and act within the applicable law.
- a Workers' Code of Conduct shall be developed and the workers shall be thereof informed. The Code of Conduct shall contain provisions such as:
  - “good neighborhood” principle, e.g., the workers shall not cause disturbances to any surrounding village related to noise, littering, or vandalism;
  - any potential or real conflicts with the local community shall be immediately reported to the management at site, and resource to direct confrontation shall be prohibited;



- the religious, cultural, and social activities of the local communities shall not be disturbed. This is specially important in the case that the workers do not share the same cultural, religious and social background (ex., migrant workers);
- etc.
- Specifically regarding workers camp management, their proximity to villages shall be thought as enough to provide opportunity for the workers to use the community services on their free time (supermarkets, restaurants, etc.), but not enough to disturb the population with noise and security lights at night.

### **Classification of impacts**

The classification of impacts on community health and safety during the construction phase can be consulted in Table 8-36 for both options.

**Table 8-36: Classification of the impacts on community health and safety - construction phase**

<b>Impacts on community health and safety - Construction phase</b>		
<b>Factors</b>	<b>Option 1b</b>	<b>Option 2</b>
Scale	Local	Local
Duration	Temporary	Temporary
	May be permanent	May be permanent
Severity	Very high	Very high
Certainty	Possible	Possible
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	No	No
Specialist study?	No	
<b>Significance</b>	High	High
<b>Mitigation measures applicable?</b>	Yes	
<b>Compensation measures applicable?</b>	No	
<b>Significance of the residual impacts</b>	Medium	Medium

#### **8.1.3.6 Economy and employment**

During construction of a new pipeline there could be new opportunities for business for the local population, although the construction of the pipeline will be a short term project (not more than 2 years).

The construction workers will obtain most of their food and fulfill other necessities from the surrounding area. This will create a potential market for the local agricultural producers and other small businesses like local shops.

The existing experience in Moldova in other construction projects financed by International Financing Institutions shows that local population can be involved in construction works as both skilled and unskilled workforce. At the same time, these workers will have the opportunity to strengthen their capacity by handling new technologies and respecting new management methods.

Therefore, the construction of the Ungheni - Chisinau Gas Pipeline project could have a positive impact on a local scale.

### **Classification of impacts**

The classification of impacts on economy and employment during the construction phase can be consulted in Table 8-37 for both options.

**Table 8-37: Classification of the impacts on economy and employment - construction phase**

<b>Impacts on economy and employment - Construction phase</b>		
<b>Factors</b>	<b>Option 1b</b>	<b>Option 2</b>
Scale	Local	Local
Duration	Temporary, short term	Temporary, short term
Severity (comparative) *	Medium	High
Certainty	Highly likely	Highly likely
Direction	Positive	Positive
Direct or Indirect?	Direct	Direct
Cumulative?	No	No
Specialist study?	No	
<b>Significance</b>	Medium	High
<b>Mitigation measures applicable?</b>	No	
<b>Compensation measures applicable?</b>	No	
<b>Significance of the residual impacts</b>	Medium	High

\* The severity is assessed in a comparative way and depends on the length of each option

#### **8.1.3.7 Cultural heritage**

Through site visits and consultation with the district culture departments, the approximate location of the main cultural, historical and archaeological sites in the project area has been determined (Section 7.3.11 and Annex 16.4).

The construction of the Ungheni-Chisinau pipeline project in the vicinity of these sites may cause their destruction, partial or total, or cause irreversible damages due to: vibrations, circulation of heavy machinery, excavations, removal of trees, etc. The routing of the pipeline took into consideration the legal distances to the nearest buildings, for what impacts on known cultural, historical and archaeological buildings are not expected. However, unknown sites might be present. For this reason, the construction works can not be

initiated without the obtainance of all relevant permits from the Ministry of Culture.

Due to the uncertainty of the baseline data, it is not possible to comparatively assess the possible impacts of each of the options.

### **Mitigation**

In order to avoid damages to *known and unknown* cultural, historical and archaeological sites, buildings and objects due to the construction of the project, the following shall be undertaken:

- An Archaeological Survey by a team of archaeologists holding valid archaeological research licenses shall be conducted before the works begin.
- The construction works should not begin until all relevant permits are provided by the responsible institution, National Archeological Agency of the Ministry of Culture.
- During the detailed design phase, consultation with the local communities shall be undertaken to determine if small objects or sites related to cultural traditions exist along the project area (like crosses placed in specific areas to mark a funeral procession, among others). The options (deviation of the pipeline route, moving of the objects) shall be discussed with the local population.
- The Construction Contractor shall establish a Chance Find Procedure.

The Chance Find Procedure shall contain measures such as:

- ceasing work as soon as historical and cultural sites, buildings, or objects are encountered during earthworks or other construction activities;
- providing relevant information to the Ministry of Culture. The Ministry will then determine the value of the historic/archaeological monuments and provide guidance on if and how to proceed with the construction. This may include excavating or otherwise documenting the monuments before proceeding, or in cases of very valuable features, developing a design to avoid the features at that site.

### **Classification of impacts**

The classification of impacts on cultural heritage during the construction phase can be consulted in Table 8-38 for both options.

**Table 8-38: Classification of the impacts on cultural heritage - construction phase**

#### **Impacts on cultural heritage - Construction phase**

<b>Factors</b>	<b>Option 1b</b>	<b>Option 2</b>
Scale	Local	Local
Duration	Permanent	Permanent
Severity	Medium	Medium
Certainty	Possible	Possible
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	No	No
Specialist study?	Yes (Archaeological Survey before construction begins)	
<b>Significance</b>	Medium	Medium
<b>Mitigation measures applicable?</b>	Yes	
<b>Compensation measures applicable?</b>	No	
<b>Significance of the residual impacts</b>	Low	Low

## 8.2 Impacts and measures during the operational phase

The operation of an underground gas pipeline is not expected to entail a large number of potential impacts,

During this stage, routine maintenance will imply visits to the above ground installations, and routine clearing of the safety strip will imply visits to specific pipeline sections. Emergency cases may occur in any section of the project.

On the physical environment, adverse impacts from the operation of the pipeline may be delivered to the water and the soil. However, because the pipeline will carry only gas that has been prepared ready for direct market use, neither routine inspection nor cleaning (“pigging”) will produce significant amounts of waste for disposal. Air quality impacts may be expected from routine and emergency flaring operations.

The potential for impacts on the community and occupational health & safety is low during operation, but in the eventuality of an emergency or accident these can be of high significance.

The impacts on the natural environment will be connected to the regular clearing of the safety strip, where no trees or vineyards may grow.

The measures proposed in this chapter shall be considered within a comprehensive **Health, Safety and Environment Plan (HSE Plan)** to be developed by the operator before the operation phase begins.

### 8.2.1 Impacts on the Physical Environment

#### 8.2.1.1 Soil and water pollution

The maintenance of the pipeline will imply the usage of a cleaning pig to clean any residues resulting from eventual condensation of the gas. This will result in a liquid stream to be received at the pig receptor stations that needs to be carefully disposed off, as it may contain acidic substances (depending on the composition of the gas). Depending on the disposal method of the liquid stream resulting from pigging, soil or the nearest water resources may be affected.

Three pig receptor stations are planned for the project to be located in Ghidighici (in the new tie-in to the Chisinau network) and in the areas of the GPRSs #2 and #3. All three locations are within the common section of the pipeline.

Map 6 in Annex 15.7 shows that some water reservoirs exist in the vicinity of the GPRS#3. This is also shown in Figure 8-6.



**Figure 8-6:** Location of the future GPRS #3 in the vicinity of water reservoirs

### **Mitigation**

To avoid spills of the pigging residue, a holding tank or a catcher shall be planned that will receive this residue when the pig reaches the receiver station. This residue should be discharged only after water-quality testing to ensure that it meets discharge criteria (IFC, 2007b).

### **Classification of impacts**

The classification of impacts on soil and water pollution during the operational phase can be consulted in Table 8-39 for both options.

**Table 8-39:** Classification of the impacts on water and soil - operation phase

<b>Impacts on water and soil - Operation phase</b>		
<b>Factors</b>	<b>Option 1b</b>	<b>Option 2</b>
Scale	Local	Local
Duration	Temporary, short term	Temporary, short term
Severity	Medium	Medium
Certainty	Possible	Possible
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	No	No
Specialist study?	Yes (water quality testing of the pig residue)	
<b>Significance</b>	Medium	Medium
<b>Mitigation measures applicable?</b>	Yes	
<b>Compensation measures applicable?</b>	No	
<b>Significance of the residual impacts</b>	Low	Low

### 8.2.1.2 Air Quality

Flaring might be necessary after pigging, in the event of an emergency (failure of the pipeline) or during maintenance works (e.g. replacement of a valve). This will give origin to air emissions, whose nature depends on the composition of the gas.

The natural gas that is shipped through transmission pipelines and delivered to consumers consists almost entirely of methane (CH<sub>4</sub>), the simplest hydrocarbon, plus small amounts of ethane (C<sub>2</sub>H<sub>6</sub>) and propane (C<sub>3</sub>H<sub>8</sub>), carbon dioxide (CO<sub>2</sub>) and nitrogen (N<sub>2</sub>) (Boot, R.D., 2007). Pollutants like CO, CO<sub>2</sub>, NO<sub>x</sub>, and unburned hydrocarbons, can be expected from the flaring of the natural gas.

Any impacts on the air quality and, as therefore, any disturbances to nearby residential areas delivered during maintenance or emergency operations will be of temporary nature.

#### **Mitigation**

In order to avoid the need for flaring, it is important to keep the pipeline in a good maintenance state.

#### **Classification of impacts**

The classification of impacts on air quality during the operational phase can be consulted in Table 8-40 for both options.

**Table 8-40: Classification of the impacts on the air quality - operation phase**

Impacts on air quality - Operation phase		
Factors	Option 1b	Option 2
Scale	Local	Local
Duration	Temporary, short term	Temporary, short term
Severity *	Low	Low
Certainty	Possible	Possible
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	No	No
Specialist study?	No	
Significance	Low	Low
Mitigation measures applicable?	Yes	
Compensation measures applicable?	No	
Significance of the residual impacts	Low	Low

## 8.2.2 Impacts on the Natural Environment

Most impacts on the natural environment are delivered during the construction stage (fell of trees, cut of riparian vegetation, disturbances to fauna). During operation, it is necessary to remove any trees grown within the safety strip since construction at regular intervals, especially in the areas located within or close by forests (Map 8 in Annex 15.7).

If chemical growth control measures or fire are used to clean the strip and keep it clear of any vegetation, impacts on the trees and other vegetation or plantations outside the safety strip may be felt in the area.

By considering the forest impact area within the 50 meter safety strip, it has been determined which of the routes implies a larger potential impact in the trees during operation. The results can be consulted in Table 8-41.

**Table 8-41: Impacts on the natural environment during operation - trees - impact area**

Option	Impacted forested areas (protected and non-protected) [ha]
1b	39.45
2	25.03

The existence of a strip with 50 meters of width in the forested areas is not expected to constitute a barrier to the passage of animals and seeds. This is due to the fact that this strip will not be regularly frequented by people or vehicles, and no regular noise, air emissions or electromagnetic radiations will be felt.

### **Mitigation**

In controlling vegetation in the safety strip, only biological and mechanical control measures shall be used.

### **Classification of impacts**

The classification of impacts on the natural environment (flora and protected areas) from the construction phase can be consulted in Table 8-42 for both options. No impacts on the fauna and ecological corridors are expected from the operational phase.

**Table 8-42: Classification of the impacts on the natural environment - operation phase**

Impacts on flora and protected areas (trees) - Operation phase		
Factors	Option 1b	Option 2
Scale	Local	Local
Duration	Permanent	Permanent



Severity (comparative) *	Medium	Low
Certainty	Definitive	Definitive
Direction	Negative	Negative
Direct or Indirect?	Direct and Indirect	Direct and Indirect
Cumulative?	Yes	Yes
Specialist study?	No	
<b>Significance</b>	Medium	Low
<b>Mitigation measures applicable?</b>	Yes	
<b>Compensation measures applicable?</b>	No	
<b>Significance of the residual impacts</b>	Low	Low

\* The severity is assessed in a comparative way and depends on the area of crossed forests (incl. protected areas) for each option

## 8.2.3 Impacts on the Human Environment

### 8.2.3.1 Agricultural assets

During the operational phase some temporary negative impacts on agricultural crops (partial destruction) could occur during maintenance works and in case of accidents.

#### **Mitigation**

The impact on agricultural crops during maintenance can be mitigated if the works are conducted with due care not to affect the plantations. In any case, the landowner shall always be previously informed of any maintenance work to be undertaken, so that strategies to avoid damages can be discussed.

The Project Owner (the MoE) and operator shall keep a link for register of grievances on their websites or customary means.

#### **Compensation**

If damages to agricultural crops are caused during maintenance, the landowner will have to be compensated for any loss of income suffered.

#### **Classification of impacts**

The classification of impacts on the agricultural assets from the operation phase can be consulted in Table 8-43 for both options.

**Table 8-43: Classification of the impacts on agricultural assets - operation phase**

<b>Impacts on agricultural assets - Operation phase</b>		
<b>Factors</b>	<b>Option 1b</b>	<b>Option 2</b>
Scale	Local	Local
Duration	Temporary	Temporary
Severity (comparative) *	Low	Medium

Certainty	Possible	Possible
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	No	No
Specialist study?	No	
<b>Significance</b>	Low	Medium
<b>Mitigation measures applicable?</b>	Yes	
<b>Compensation measures applicable?</b>	Yes	
<b>Significance of the residual impacts</b>	Low	Low

\* The severity is assessed in a comparative way and depends on the area of crossed agricultural areas for each option

### 8.2.3.2 Occupational Health & Safety

Maintenance/repair of the pipeline, or excavation by non-gas utility personnel, may result in accidental rupture or gas leakage with consequent exposure of the workers to harmful gases and an explosive atmosphere.

#### Mitigation

The operator of the pipeline shall act in accordance with the requirements of Moldova Law 186 on Occupational Safety and Health and international best practices.

Other measures to be undertaken shall include at least (IFC, 2007c):

- Training of employees and contractor personnel in safety procedures, together with provision of appropriate tools and equipment;
- Identification and location of existing gas and other buried utility infrastructure prior to excavation for installation or repair of gas pipelines;
- Removal of sources of ignition prior to gas venting for maintenance and repair activities, and purging of gas from pipeline or pipe components prior to welding or cutting activities;
- Measures for emergency prevention, preparedness and response involving appropriate public authorities, as well as training of workers for applying these.

#### Classification of impacts

The classification of impacts on occupational health & safety from the operation phase can be consulted in Table 8-44 for both options.

**Table 8-44: Classification of the impacts on occupational health & safety - operation phase**

Impacts on occupational health & safety - Operation phase		
Factors	Option 1b	Option 2
Scale	Local	Local

Impacts on occupational health & safety - Operation phase		
Factors	Option 1b	Option 2
Duration	Temporary, short term  May be permanent	Temporary, short term  May be permanent
Severity	Very high	Very high
Certainty	Possible	Possible
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	No	No
Specialist study?	No	
<b>Significance</b>	High	High
<b>Mitigation measures applicable?</b>	Yes	
<b>Compensation measures applicable?</b>	No	
<b>Significance of the residual impacts</b>	Medium	Medium

### 8.2.3.3 Community Health & Safety

The most serious impact can be felt in case of a gas leakage followed by an explosion. This might entail damages to structures (roads, railways) and risks for human life.

Gas leakage may result from accidental rupture of the pipeline during repairs or from contacts during excavation unrelated to the gas system.

#### **Mitigation**

Onshore oil and gas development facilities should be designed, constructed, and operated according to international standards for the prevention and control of fire and explosion hazards (IFC, 2007b).

The gas pipeline operator shall establish an Emergency Prevention, Preparedness and Response Plan with measures involving appropriate public authorities.

One of the measures shall be the establishment of a telephone notification system to respond to reports of leaks or general safety questions posed by the surrounding communities.

The operator shall also provide a pipe location service to assist other contractors and the general public in determining the location of the infrastructure prior to any works in the proximities (IFC, 2007c).

#### **Classification of impacts**

The classification of impacts on community health & safety from the operation phase can be consulted in Table 8-45 for both options.

**Table 8-45: Classification of the impacts on community health & safety - operation phase**

<b>Impacts on community health &amp; safety - Operation phase</b>		
<b>Factors</b>	<b>Option 1b</b>	<b>Option 2</b>
Scale	Local	Local
Duration	Temporary May be permanent	Temporary May be permanent
Severity	Very high	Very high
Certainty	Possible	Possible
Direction	Negative	Negative
Direct or Indirect?	Direct	Direct
Cumulative?	No	No
Specialist study?	No	
<b>Significance</b>	High	High
<b>Mitigation measures applicable?</b>	Yes	
<b>Compensation measures applicable?</b>	No	
<b>Significance of the residual impacts</b>	Medium	Medium

## 9. Selection of the routing option

The assessment of impacts undertaken in Section 8 of this ESIA has been made in a comparative way for both routing options under study in the feasibility stage of the Ungheni-Chisinau pipeline project. Table 9-1 summarizes the classification of the impacts during construction and operation of each of the options. In order to analyse the worse-case scenario, the impacts' classification presented on the table is the one made *before mitigation* measures are applied.

In order to compare each option, for each classification a number has been attributed according to the following scale:

- Negative low: +1
- Negative medium: +2
- Negative high: +3
- Negative very high: +4
- Positive low: -1
- Positive medium: -2
- Positive high: -3
- Positive very high: -4

This scale implies that the option with less significant negative impacts and/or with more significant positive impacts shall have less “points” and shall be the one selected.

The results of Table 9-1 show that Option 1b has less points (35 for construction and 10 for operation: total of **45** points) than Option 2 (37 for construction and 11 for operation: total of **48** points). This means that Option 1b is the one which implies less significant negative impacts, although Option 2 would imply a higher positive impact (on economy and employment) due to its larger extension.

It is recommended, as therefore, to construct Option 1b.
--

**Table 9-1: Summary of the classification and comparison of the impacts of Options 1b and 2**

Impacted factor		Significance of impacts before mitigation							
		<i>Construction phase</i>				<i>Operation phase</i>			
		Option 1b	Points	Option 2	Points	Option 1b	Points	Option 2	Points
Physical environment	Soil erosion	High	+3	Medium	+2	--	--	--	--
	Soil mixing, rutting and compaction (soil productivity)	Medium	+2	High	+3	--	--	--	--
	Soil pollution by waste deposition	Low	+1	Medium	+2	Medium	+2	Medium	+2
	Water resources	Medium	+2	Medium	+2				
	Air quality	Low	+1	Medium	+2	--	--	--	--
	Noise levels	Low	+1	Medium	+2	--	--	--	--
	Landscape - temporary	Low	+1	Medium	+2	--	--	--	--
	Landscape - permanent	High	+3	Medium	+2	--	--	--	--
Biological environment	Fauna	High	+3	Medium	+2	Low	+1	Medium	+2
	Flora	High	+3	Medium	+2				
	Protected areas	Medium	+2	High	+3				
	Ecological corridors	Low	+1	Low	+1	--	--	--	--
Human environment	Land and property	High	+3	Very high	+4		--	--	--
	Access	Low	+1	Low	+1	--	--	--	--
	Utilities	Low	+1	Low	+1	--	--	--	--
	Occupational H&S	Very high	+4	Very high	+4	Very high	+4	Very high	+4
	Community H&S	High	+3	High	+3	High	+3	High	+3
	Economy and employment	Medium	-2	High	-3	--	--	--	--
	Cultural heritage	Medium	+2	Medium	+2	--	--	--	--
SUM		35		37		10		11	

The impacts on **soil** have a special importance on the context of this project, given the state of degradation of the Moldovan soils, of which the economy is so dependent. Option 1b affects more significantly eroded land than Option 2. On the other side, Option 1b affects less agricultural land than Option 2. Due to its larger extent, Option 2 has more potential to cause soil pollution by waste deposition during construction.

In relation to the impacts on **water**, distinguishing the significance of impacts between the two options was not possible. If, on one hand, Option 2 implies a larger number of crossings (32% more) than Option 1b, it implies a smaller area of possibly affected lakes/reservoirs/wetlands than Option 1b (41% less). The extent of possibly impacted rivers is almost the same for both options.

The impacts on soil and water quality during operation are assumed as the same for both options, as these can only be eventually delivered in the pigging facilities, which exist in the same number for both cases.

Option 2 runs in the proximity to more residential areas than Option 1b, implying a higher number/area of sensitive receptors for **air** and **noise** emissions during construction. The same is valid for the eventual air quality impacts derived from emergency and maintenance operations.

The temporary impacts on **landscape** during construction are higher for Option 2 because the length of the pipeline is longer. The permanent impacts (from clearing for the safety strip) are, however, more significant for Option 1b, as a larger area of trees and vineyards needs to be removed during construction and kept cleared during operation.

In the same sense, Option 1b is expected to entail more significant impacts on non-protected terrestrial **fauna**, as a larger area of forests is expected to be crossed. The impacts on aquatic fauna are classified as being similar for both options for the reason above described for the impacts on water.

In what respects the non-protected **flora**, it is evaluated that Option 1b implies more significant impacts than Option 2, because Option 1b implies a larger area of permanent impacts (as a result of tree clearing during construction and during operation). Although Option 2 implies a larger number of water crossings, the impacts on the riparian flora derived thereof are reversible.

Option 1b implies the loss of less **protected areas** than Option 2, and which are less rich in threatened and protected species. In addition, the fall of protected trees on the ROW of Option 1b can be avoided (because the pipeline just borders the Cazimir-Milesti reserve and this can be shifted during detailed design), but that of Option 2 cannot (the line crosses mandatorily the reserve Seliște-Leu). For these reasons, Option 2 is classified as having a more significant impact on protected areas than Option 1b.

Both options cross the same **ecological corridor** between the core areas Plaiul Fagului and Codrii, with the same expected impacts' significance.

Option 2 is expected to affect a larger area of **land** and **property** (pastures and agricultural fields, including ephemeral plantations, orchards and vineyards) than Option 1b. However, the compensation costs are lower than those for Option 1b.

The impacts on **access** and **utilities** during construction are assessed as being similar for both options. The same is the case for **occupational** and **community health & safety**.

Because Option 2 is longer, more or longer lasting job opportunities might be created than in case Option 1b is built. For this reason, the positive impact on **economy** and **employment** during construction is higher for Option 2.

Due to a lack of precise baseline data, it is not possible to comparatively assess the potential impacts on **cultural heritage** of each of the options.



## 10. Environmental and Social Management Plan

The Environmental and Social Management Plan (ESMP) for the Ungheni-Chisinau pipeline project is presented in this Section.

The ESMP is a key document that lists the environmental and social requirements and details the procedures necessary for managing the significant issues connected to the proposed project activities. The ESMP is developed to ensure that all potential impacts are **identified** and properly **avoided, mitigated, compensated** and **monitored** throughout the next stages of the project. This includes also Health & Safety (H&S) related risks.

The identification of impacts has been undertaken in Section 8, together with a description of mitigation, avoidance and compensation measures. These are included in the ESMP in a tabular form. In addition, a set of monitoring measures is defined in the present ESMP. Two types of monitoring actions are predicted:

- Compliance monitoring: monitoring actions to verify if the mitigation measures are implemented, which include: visual inspections of the works, review of reports/plans, interviews with workers and PAPs, reporting.
- Effects monitoring: monitoring actions to verify if the mitigation measures have the desired result, which include: sampling and analysis of environmental parameters, visual inspection of environmental factors (e.g., inspecting soil for signs of enhanced erosion post-construction).

Monitoring actions can be further classified into:

- Self monitoring (by the Construction and Operation Contractors): generally, self-monitoring is a basic requirement to show the compliance of the facility with the standards as outlined in the ESMP, and represents a suitable basis for the successful realization of the external auditing procedures. In addition, self controlling is an appropriate method of conservation of evidence in case of an accident or emergency situation. The Contractors shall hire environmental teams to undertake these tasks.
- External monitoring (or audit): the auditing of the implementation of the mitigation and monitoring measures for the proposed project shall be done by external entities, namely the responsible governmental authorities and the Project Owner.

### 10.1 Roles and responsibilities

This section presents the roles and responsibilities of each of the parties intervenient in the management of the environmental and social aspects of the project during the construction and operational periods, namely:

- MoE/MEPIU - Ministry of Economy/ Moldova Energy Project Implementation Unit
- CEs - Consulting Engineers:
  - Environmental Consultant
  - LRF Consultant
- CC - Construction Contractor
- OC - Operation Contractor
- Governmental authorities:
  - MoEn - Ministry of Environment
  - Central and Raional Environmental Inspections
  - Centre for Public Health
  - Raional Labour Inspections
  - National Archaeology Agency

### 10.1.1 MoE/MEPIU

As the Project Owner/implementation agency, the **MoE/MEPIU** has the responsibility to ensure that the project is completed and operated in accordance with the commitments of this ESIA. In particular, the MoE/MEPIU shall:

- a) Prepare the project's ESMP and formal Livelihood Restoration Framework (LRF):
  - i) The project's ESMP is presented in this chapter (Section 10 of this ESIA);
  - ii) The full LRF shall be prepared based on the Resettlement Policy Framework (RPF) present in Section 12 of this ESIA.
- b) Update the project's ESMP and LRF as necessary for any changes in the scope of contract.
- c) Apply and monitor the LRF.
- d) Make assure that the Construction and Operation Contractors understand their responsibilities and in fact perform the project in accordance with this ESIA, the ESMP (Section 10 of this ESIA) and the ESAP (Section 13 of this ESIA).
- e) Consider, review and if appropriate accept the HSE Plans (Health, Safety and Environment Plans):
  - i) the Construction Contractor shall prepare a HSE Plan for construction based on the present project's ESMP (Section 10.1.3 below), which will then be reviewed and accepted by the MoE/MEPIU.
  - ii) The Operation Contractor shall prepare a HSE Plan for operation based on the present project's ESMP (Section 10.1.4 below), which will then be reviewed and accepted by the MoE/MEPIU.

- f) Audit the effectiveness of the HSE Plan for construction and of the HSE Plan for operation in achieving environmental best practice, statutory compliance and community assurance.

The MoE/MEPIU might hire third parties to undertake the tasks as above described (see next Section 10.1.2).

## 10.1.2 Consulting Engineers

As the MoE/MEPIU does not have the capacity to implement all activities in accordance with the ESIA requirements, it is assumed that third parties will be involved on its behalf, i.e., **Consulting Engineers (CEs)**.

It is suggested that an Environmental Consultant and a LRF Consultant are engaged on behalf of the Project Owner to perform the tasks a) to e) above (Section 10.1.1) related to the ESMP and the LRF issues, respectively. Task a i) - prepare the project's ESMP - has been completed and the results are available in this ESIA in Section10.

### 10.1.2.1 Environmental Consultant

The Environmental Consultant will conduct regular site visits (audits) and analyze the reports produced by the Construction Contractor (Section 10.1.3) and the Operation Contractor (Section 10.1.4). Based on these site visits and reports, the Environmental Consultant will report regularly to MoE/MEPIU on the progress of implementation of the HSE Plans. The visits and reporting frequency is suggested as follows:

- Quarterly during construction;
- Once per year during the first 3 years of operation.

### 10.1.2.2 LRF Consultant

Monitoring shall be carried out by the LRF Consultant on a monthly basis and will be reported to the MoE on a quarterly basis until the end of the compensation process. The LRF Consultant will be responsible for determining if any follow-up actions are necessary and ensuring these actions are undertaken.

Prior to the delivery of compensation payments to the PAPs, the MoE will announce the compensation dates, including a detailed compensation schedule community by community. The LRF Consultant will monitor to ensure that no construction in the affected areas will commence until the payment of compensation has been fully completed and that concerns from PAPs are identified timely and addressed effectively.

Please refer to Section 12 for further details.

### 10.1.3 Construction Contractor

The **Construction Contractor's** (CC) responsibilities are to:

- a) Prepare a HSE Plan for construction based on the present project's ESMP;
- b) Assume full responsibility for the HSE Plan for construction under the contract;
- c) Submit the HSE Plan for construction for the MoE/MEPIU's acceptance (Section 10.1.1);
- d) Update the HSE Plan for construction as necessary (and as required) as a result of:
  - i) any changes to the project's ESMP;
  - ii) any identified corrective actions arising from audit non-conformances;
  - iii) identified improvement areas.
- e) Ensure that the HSE Plan for construction is fully implemented and maintained.

For the tasks above, the CC shall identify an HSE team, whose composition will depend on the contractor's own procedures and organization. It is suggested to include at least the following persons:

- Contractor's HSE Manager (C-HSE-M): responsible for coordinating and managing all the environmental/social/H&S activities during the construction phase; prepares the contractor's HSE Plan for construction; acts as main point of contact between the regulatory authorities and the project on environmental and social issues.
- Contractor's HSE Site Representative (C-HSE-SR): reports to the C-HSE-M and is directly involved in managing and coordinating environmental, social and H&S activities on-site; organizes trainings; makes weekly site inspections.
- Contractor's Site Foreman (C-SF): reports on environmental activities to the C-HSE-SR; is every day at site and completes a daily environmental, social and H&S log.

### 10.1.4 Operation Contractor

In a similar way as the Construction Contractor, the **Operation Contractor** shall prepare a HSE Plan for operation to describe how environmental and social matters will be managed at the pipeline's site, and how the ESIA's requirements will be applied in practice.

The HSE Plan for operation shall also be subject of approval by the Project Owner/Implementation Agency (MoE/MEPIU), and its implementation and eventual updates must be guaranteed by the Operator. For this, the Operator shall deploy an HSE team with the following suggested composition:

- Operator's HSE Manager (O-HSE-M): responsible for coordinating and managing all the environmental/social/H&S activities during the operation phase; prepares the contractor's HSE Plan for operation; acts as main point of contact between the regulatory authorities and the project on environmental and social (incl. H&S) issues.
- Operator's HSE Supervisor (O-HSE-S): responsible for informing staff of HSE issues; responsible for implementing site based HSE management measures; makes regular site visits; reports to the O-HSE-M.

#### 10.1.5 Governmental authorities

Some **governmental authorities** have responsibilities in the ESMP related issues of the Ungheni-Chisinau pipeline project. These have been identified as being the MoEn - Ministry of Environment, the Central and Raional Environmental Inspections, the Centre for Public Health, the Raional Labour Inspections, and the National Archaeology Agency.

The identified authorities have monitoring responsibilities which are described in 12-2 in this Section. These are:

- Ministry of Environment and Central and Raional Environmental Inspections:
  - a) Verify the success of re-vegetation measures on land and river banks: six months after the end of construction;
  - b) Provide information on the extent and severity of damages to agricultural soils: after the first and second growing seasons;
  - c) Verify the obtainance and validity of the water withdrawal permit (in case one is necessary to source water for hydrotesting of the pipeline);
  - d) Verify the reports which disclose information about grievances received and the project to the stakeholders;
  - e) Verify the obtainance and validity of the permit from the National Archaeology Agency;
- Raional Labor Inspections:
  - f) Verify the accidents, incidents and breach of legislation reports related to occupational health and safety: every 3 months during construction, and every 6 months during operation;
- Centre for Public Health:

- g) Verify the accidents, incidents and breach of legislation reports related to community health and safety: every 3 months during construction, and every 6 months during operation;
  - h) Analysis and approval of the emergency prevention, preparedness and response plan for operation.
- National Archaeology Agency:
    - i) Analysis and approval of the archaeological survey results;
    - j) Verify any Chance Find Procedure reports.

In addition to the above listed ESMP-related responsibilities, the MoEn has the responsibility to analyse the present ESIA, request eventual amendments and finally make a decision on the issuance or not of the Environmental Permit for the project.

## **10.2 Adaptive management**

The monitoring of the works may reveal the necessity to adapt the measures of the ESMP to specific site conditions not known at the time of preparation of this ESIA. Items which are not anticipated in the ESMP may come up, as well as areas that need improvements. The Contractors shall be ready to handle both cases by adapting the dispositions of this ESIA. This has been additionally described under Sections 10.1.3 and 10.1.4 above.

Any changes to the commitments of this ESIA and the ESMP shall not be undertaken without the previous approval of the Project Owner and the Lenders.

## **10.3 Compilation of the Environmental and Social Management Plan**

Table 10-1 and Table 10-2 present the ESMP for the construction and operation phases of the Ungheni-Chisinau pipeline project, which includes the following:

- The environmental attribute (e.g. air quality) that is likely to be impacted;
- A summary of the potential impact and/or likely issue;
- The identified mitigation and compensation actions that aim to eliminate and/or reduce the potential impact to acceptable levels;
- The compliance and effects monitoring actions to be undertaken;
- The timing and frequency for implementing the mitigation and monitoring actions;
- The responsible entity for implementing the mitigation measures and monitoring actions identified.

**Table 10-1: Environmental and Social Management Plan for the Ungheni-Chisinau pipeline project - Mitigation and/or compensation measures**

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
GENERAL				
All components	The construction and operation of the pipeline may cause adverse impacts especially on sensitive locations (heavily eroded areas, proximities of natural reserves, proximities to villages, etc.)	The Project Owner shall prepare a linear diagram of the entire pipeline route to allow the contractors to easily identify all risk/sensitive areas described in this ESIA	Before tendering	MoE/MEPIU
CONSTRUCTION PHASE				
Soil	Temporary access roads, movement of construction machinery, digging of trenches and removal of vegetation are likely to cause erosion effects, especially in areas where the soil is already eroded or landslides exist: These areas shall be precisely identified and mapped as part of the pre-construction Landslides and Erosion Survey.	<b>Landslides and Erosion Survey:</b> A new landslides and erosion survey in the project area shall be undertaken. It will be of interest also to avoid crossing of potential dangerous areas where trenching may trigger a new landslide. This survey shall be undertaken in direct contact with the farmers and land owners, which may help pointing site-specific soil characteristics and flag any sensitive areas which may exist within the construction strip or within the areas defined for location of temporary or permanent structures. The pipeline route shall be deviated from and structures shall not be placed on landslides and severely eroded areas to the extent possible.	During the detailed design phase and at least three months prior to any heavy machinery working in the RoW or in clearing activities	Construction Contractor (the support of the farmers and land owners shall be requested)
		Prepare a <b>Soil Management and Erosion Control Plan</b> with measures that include, but are not limited to:	One month before the works begin	Construction Contractor
		In the case landslides cannot be avoided, the pipeline shall be installed beneath the failure plane.	Continuously during construction on areas of landslides	
		The amount of disturbance to the soils shall be minimized, i.e., all works shall be kept within the construction strip;	Continuously during construction	

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
		<p>On the sections where crossing landslides and severe erosion areas cannot be avoided, the following shall be alternatively undertaken:</p> <ul style="list-style-type: none"> <li>• Installation of slope drains providing a temporary outlet for runoff water;</li> <li>• Construction of temporary diversion channels to prevent the flow from damaging erodible or unstable areas;</li> <li>• erosion control structures (blankets, mats, geo-textiles) shall be implemented;</li> <li>• the slopes shall be track walked up and down to improve the stability of the soil.</li> </ul>	One week before the works begin on areas of landslides and severe erosion	
	During excavation of the trenches, there is a risk for mixing topsoil with subsoil, which may lead to changes in the concentration of nitrogen, phosphorus and potassium ions in the soil, as well as to losses of organic material, mulch, seed banks, enzymes and bacteria.	The <b>Soil Management and Erosion Control Plan</b> shall include top soil management measures such as:	One month before the works begin	Construction Contractor
		The top soil shall be stripped from the entire construction strip, i.e., trench + spoil area + work area width	One month before the works begin	
		Excavated parent material or sub soils shall be segregated during construction and excavation and shall not be mixed with top soils; stock the stripped top soil and the excavated subsoil in different piles; if required (e.g., when the distance between piles is inferior to 1 m), a physical barrier (e.g., straw mulch) shall be used to assist in delineating the separation between the two piles;	Continuously during excavation	
		All stripped topsoil must be securely stored during construction, and replaced to the surface of the construction strip. The top soil can not be used for any other purpose or replaced to any depth greater than the original topsoil height.	Continuously during excavation	
		The topsoil pile must not exceed 2 meters in height to prevent degradation of the soil structure	Continuously during excavation	
		Handle all soil within the confines of the designated construction strip of 16 meters width, including the soil deposits	Continuously during excavation	



Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
		All stripped topsoil must be replaced to the surface of the construction strip immediately following construction and backfilling. The topsoil must be spread evenly across the strip covering the top 20cm of the ground surface	During closing of the trenches	
		Take measures required to prevent erosion (wind and water) of the stockpiled topsoil. This may require the use of plastic or HDPE covering, jute matting, water, mulch, or tackifiers to stabilize the topsoil where persistent high winds are eroding topsoil piles or removing topsoil from the construction strip.	In the presence of high winds during excavation	
	<p>Significant rutting can occur when heavy vehicles and machinery circulate on saturated soils or wetlands. Rutting compacts a large amount of soil into a very small space, eliminating available pore space for rooting, water and nutrient flow.</p> <p>The circulation of construction machinery can lead in addition to compaction of the soils, which causes increased soil density and reduced permeability</p>	If standing water or saturated soils are present, pause the construction activities. In alternative, the equipment and vehicles shall be operated on timber riprap or prefabricated equipment mats. In areas with soils sensitive for compacting excavator support mats should be used for temporary access.	Continuously during construction	Construction Contractor
		The Soil Management and Erosion Control Plan shall include soil reinstatement measures to be undertaken after backfilling of the trenches such as:	One month before the works begin	
		In case compaction of the soils has occurred, mechanical decompactors or sub-soilders can be used to relieve compaction that has occurred in deeper soil layers (up to 60 cm from the surface). This activity should also be carried out on all temporary traffic and storing areas, which are no more needed after the end of the construction phase	After construction	
		the ground shall be recountoured to match the topography of the area. This may imply filling up or smoothing of any ruts	After construction	
		all stripped topsoil from the construction strip must be replaced to the surface of the construction strip immediately following backfilling. The topsoil must be spread evenly across the strip covering the original topsoil height.	After construction	

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
		temporary access roads shall be rehabilitated and replanted after construction	After construction	
		vegetation with short roots like vegetables, cereals and pastures shall be replanted within the construction strip with the originally grown species.	After construction	
		in areas where originally forest trees, orchards and vineyards were presented, the RoW shall be replanted with local short-rooted vegetation	After construction	
		organic erosion control mats shall be installed in the areas of landslides and highly eroded areas shown in the Map No.4 in Annex 15.7 to enhance reinstatement	After construction	
		any evidence of erosion after reinstatement shall be mapped and considered for the final reinstatement. The need for additional erosion control measures shall be assessed.	After construction	
	The construction activities will generate waste which has the potential to physically and chemically affect the soils of the project area. The following waste streams are expected: soil and rocks from foundation activities for the associated infrastructures; excess subsoil or spoil from trenching; plant debris; construction waste like unused / unusable construction material, wood from frameworks, maintenance waste, packaging material, empty containers, etc.; hazardous waste: fuel, engine oil, antifreeze, and lubricants; drums and containers (of	<p>A <b>Waste Management Plan</b> shall be developed with measures to handle the different waste streams. The following basic principles shall be considered in the WMP:</p> <ul style="list-style-type: none"> <li>• A waste management hierarchy of avoidance, minimization, reuse, recycling, treatment and disposal</li> <li>• Segregation of all waste based on their nature and ultimate disposal sites;</li> <li>• good technical planning to minimize the generation of construction waste;</li> <li>• staff training to increase awareness of waste management hierarchy and procedures, segregation, storage, and labeling issues;</li> <li>• inspecting and auditing principles.</li> </ul> <p>The following measures shall be included in the WMP:</p>	One month before construction begins	Construction Contractor
		The construction waste shall be reused as much as possible on site;	Continuously during construction	

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
	hazardous and non-hazardous materials); domestic/household garbage; domestic waste water.	Any construction debris generated shall be sorted by type managed and ultimately disposed, reused or recycled in accordance with the WMP	After construction	
		portable toilets must be made available at all camps and along the entire RoW, and the waste water originated must be properly disposed.	Continuously during construction	
		<p>To handle hazardous waste:</p> <ul style="list-style-type: none"> <li>• Store the hazardous waste on separate locations on site with the following characteristics:</li> <li>• Labeled, enclosed and impermeable containers;</li> <li>• Basement made of impermeable plastic layers;</li> <li>• Safety sheets available in the containers;</li> <li>• Final transport and disposal to be done by an authorized company.</li> <li>• Agree with the provider of oils, antifreeze and other hazardous materials to take back the used empty drums after construction;</li> <li>• Drain the oil filters to remove the excess oil;</li> <li>• Deliver the used oil to companies which may be able to recycle it, either in Moldova or abroad.</li> </ul>	<p>Continuously during construction</p> <p>After construction</p>	
		<p>The excess subsoil (spoil) shall be handed over to land owners which are interested in reinforcing eroded areas on their lands.</p> <p>If this is not possible, or no demand exists, the Construction Contractor shall deposit excess soil at existing landfills after agreement with the regional authorities and approval by the Banks concerning the quantity and types of waste to be deposited. The available landfills on each district are:</p> <ul style="list-style-type: none"> <li>• Ungheni: Ungheni and Cornesti landfills;</li> <li>• Calarasi: Calarasi and Oniscani landfills;</li> <li>• Nisporeni: Boltun, Iurcenii and Cristesti landfills;</li> <li>• Strasenii: Strasenii and Romanesti landfills.</li> </ul>	Continuously during construction	

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
		<p>The soil waste generated in Chisinau cannot be transported to the existing landfill (in Tintareni), as this is presently closed. The Construction Contractor shall discuss with the authorities in Chisinau how to provide the soil waste a proper final destination. This will require approval by the Banks prior to use to ensure compliance with project standards.</p> <p>These and other excess spoil management solutions need to be planned in detail at the design stage, as spoil management implies also truck traffic management and site restoration planning.</p>		
		The recyclable waste generated on site shall be handed over to duly authorized agents (list in Annex 16.5 of this ESIA).	Continuously during construction	
Water resources	Crossing of surface waters with open cut technique causes losses of riparian vegetation, suspended solid sediments in the river's water, and disruption of the river's flow (impacts on aquatic fauna are considered later in this ESMP under "other fauna")	<p>A <b>Hydrological Survey</b> shall be undertaken. which will allow:</p> <ul style="list-style-type: none"> <li>• Making a detailed inventory of all pipeline crossings</li> <li>• Determining the width and depth of the rivers and other water features to be crossed - it is known that in the project area only small and low flow streams are expected to be crossed</li> <li>• Identifying those features prone to erosion and water channel changes</li> <li>• Determining any perennial water features and the period of the year when these may be dry or have lower water levels</li> <li>• Determining the areas where aquatic vegetation is scarce or absent (to be preferably used as crossing location unless other limitations exist).</li> <li>• Flagging the boundaries of wetlands</li> </ul>	During the detailed design phase and covering Winter and Summer periods	Construction Contractor
		A <b>Water Crossing Management Plan</b> shall be developed based on the Hydrological Survey and on the	One month before construction begins	

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
		Aquatic Life Survey (described in Section 8.1.2.3 of this ESIA and later in this ESMP). In general, the Plan shall be based on the following hierarchy: <ul style="list-style-type: none"><li>• 1st: avoidance of crossing areas where sensitive habitats, spawning, feeding, over-wintering or nursery areas, or protected species are present);</li><li>• 2nd: usage of open-cut wet ditch crossing methods;</li><li>• 3rd: usage of open-cut dry ditch crossing methods. Specifically, measures such as the following shall be included:</li></ul>		
		depending on the results of the Aquatic Life Survey, plan water crossing activities in such a way not to disturb the ecological activities supported by the river (ex. spawning season).	During establishment of the construction schedule	
		if no ecological activities supported by the water courses are expected in summer, plan water crossing during summer low flows and low water level;		
		in case of seasonal streams, plan the crossing when the stream is dry;		
		In-stream construction activities (including trenching, pipe installation, backfill, and restoration of the streambed contours) shall be completed in the shortest time possible; crossing of small water courses (< 10m wide) can often be completed in less than a day while one to three days are generally required for medium sized crossings ( 10-20m) (Reid & Anderson, 1999)	Continuously during open cut crossings	
		Plan the crossings preferably on areas where aquatic vegetation is scarce or absent;	During the detailed design phase	
		No crossing shall be planned to areas where sensitive habitats and fish spawning, feeding, over-wintering or nursery areas exist (as a result of the Aquatic Life Survey);	During the detailed design phase	
		If the Aquatic Life Survey detects species which are highly sensitive to release of sediments into the water, no wet crossing shall be planned to be undertaken up to 1	During the detailed design phase	

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
		km upstream of the areas of such species. In such cases, either the crossing is undertaken on another location or a dry ditch method shall be used.		
		The riparian vegetation will be cleared only immediately before the crossing is undertaken, to minimize erosion of the river banks	Immediately before open cut crossings	
		All disturbed areas of the work site shall be stabilized immediately	After open cut crossings	
		All water body banks will be restored to preconstruction contours and to a stable condition. Where present, existing gravel and cobble streambed materials will be used for restoration of the streambed and banks. Reno mattresses and gabions will be used to stabilize steep banks and escarpments.	After open cut crossings	
		Disturbed riparian areas will be re-vegetated with conservation grasses or native plant species	After open cut crossings	
	In slope areas leading to water courses, construction works may generate sediments that can be dragged to the water course. Map No. 4 in Annex 16.7 shows where these areas can be found within the project area. The results of the Landslides and Erosion Survey will complement the data show in this map.	<p>In slope areas leading to water courses, it is necessary to avoid site sediment runoff from reaching the water courses. This can be done by, e.g.:</p> <p>Implement erosion control structures (blankets, mats, geo-textiles) on the slopes before the works begin. In alternative to the above, the slopes leading to water courses may be track walked up and down to improve the stability of the soil. Install sand or gravel bags along the working area to absorb any sediment or other runoff before it reaches the water courses.</p>	Before construction in slopes leading to water courses	Construction Contractor
	Water contamination might be caused by the incorrect	Preparation of a <b>Spill Prevention and Response Plan</b>	One month before the works begin	Construction Contractor

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
	disposal or accidental run-off of sewage, fuel, new and used engine oil and lubricants, waste water resulting from washing of vehicles and machinery, and sediments resulting from earth works.	<p>Develop a <b>Waste Management Plan</b> with measures for liquid waste streams including:</p> <ul style="list-style-type: none"> <li>• Providing temporary toilet facilities at all camps and along the entire RoW, as well as guarantying the proper disposal of the waste water.</li> <li>• Store the hazardous waste on separate locations on site with the following characteristics:</li> <li>• Keeping a minimum distance of 50 meters to water courses;</li> <li>• Do not locate the storage area in slopes leading to water courses;</li> <li>• Labeled, enclosed and impermeable containers;</li> <li>• Basement made of impermeable plastic layers;</li> <li>• Safety sheets available in the containers.</li> </ul>	Continuously during construction	Construction Contractor

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
		<p>Ideally, vehicle maintenance and washing occurs in garages and washing facilities. However, if this is not possible:</p> <ul style="list-style-type: none"> <li>•Refueling and lubrication of equipment, as well as washing and maintenance, shall not be undertaken at a distance shorter than 50 m from surface water features.</li> <li>•Clearly mark all washing and maintenance areas, and inform workers that all washing/maintenance must occur in this designated area.</li> <li>•These areas shall be properly connected to a storm drain system; contaminated drainage from maintenance must be orderly disposed of as hazardous waste.</li> <li>•To avoid contamination of ground water, these activities shall only be undertaken above a proper isolating and impermeable surface.</li> <li>•Dispose of all used oil, antifreeze, solvents and other automotive-related chemicals according to manufacturer instructions and national laws.</li> </ul>	Continuously during construction	Construction Contractor
	<p>Water contamination may happen due to an inadequate disposal of the water used for the hydrostatic testing.</p> <p>Water sourcing for hydrotesting may also adversely affect the water level or flow rate of the surface or underground natural water body chosen.</p>	To avoid an overuse of water for hydrostatic testing, obtain permits for the withdrawal of water from nearby sources and respect the amount of water authorized for withdrawal	One month before the works begin	Construction Contractor
		The IFC recommendations shall also be followed, i.e., the withdrawal rate (or volume) should not exceed 10 % of the stream flow (or volume) of the water source	During sourcing of water for hydrostatic testing	
		Strictly follow the disposal and other requirements from the water use permit	After hydrostatic testing	
		If discharge to surface waters or land surface is necessary:	--	
		Reduce the need for chemicals by minimizing the time that test water remains in the equipment or pipeline	Continuously during hydrostatic testing	



Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
		Use the same hydrotest water for multiple sections	Continuously during hydrostatic testing	
		Hydrostatic test water quality must be treated to meet the national discharge limits or the water withdrawal permit limits	Before discharge of hydrostatic test water	
		Install break tanks or energy dissipaters (e.g. protective riprap, sheeting, tarpaulins) to prevent erosion from the discharge flow	Immediately before discharge of hydrostatic test water	
		If discharged to land, the discharge site must be selected to prevent flooding, erosion, or lowered agriculture capability of the receiving land	One week before hydrostatic testing	
	Specific impacts on the wetlands may be caused by the construction activities	Wetland boundaries shall be marked in the field with signs and/or flagging.	One day before crossing or working nearby wetlands	Construction Contractor
		Work areas (such as storage and deposit areas) are prohibited in wetlands. Any additional working area, if required, shall be located a minimum of 50 m away from wetland boundaries	Continuously during crossing or working nearby wetlands	
		Remove all cut trees and branches from the wetland and stockpile in an upland area; give the materials to the local inhabitants, if they so desire; in case there is no interest from the community, save the materials for disposal.	Continuously during crossing or working nearby wetlands	
		No access roads shall be constructed on wetlands.	Continuously during crossing or working nearby wetlands	
		Assemble the pipeline in an upland area unless the wetland is dry enough to adequately support skids and pipe.	Continuously during crossing or working nearby wetlands	
		Seed, fertilizers or mulch shall not be applied in wetlands for re-vegetation purposes. Restrict the use of fertilizer within 50 m of wetlands. The ROW in wetland areas shall not be reseeded unless specified by the appropriate government agency.	After crossing or working nearby wetlands	
Noise levels	The construction of the pipeline and associated	Trucks and vehicles crossing housing areas shall reduce their speed to a maximum of 30 km/h	Continuously during construction	Construction Contractor

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
	infrastructures will cause noise emissions during clearing, trenching, movements of vehicles and machinery, hauling, stringing, welding, lowering, excavations, concreting, backfilling, usage of pumps and compressors, etc.	The construction works shall be restricted to daylight hours.	Continuously during construction	
		In case there is a need to perform activities during the night hours (19h - 7h), it shall be assessed whether a permit is needed. In such cases, the population shall be previously informed.	One week before night works are undertaken	
		The vehicles and equipments shall be kept in good maintenance state.	Continuously during construction	
		If generators are used, they shall be located far from the residential areas and workers accommodations at a distance that will allow attenuation of noise to a level within project limits; in case this is not possible, sound barriers shall be installed.	Continuously during construction	
Air Quality	<p>The construction of the pipeline and associated temporary and permanent infrastructures will cause air emissions during clearing, trenching, movements of vehicles and machinery, excavations, concreting, backfilling, etc.</p> <p>Other impacts on the air quality during construction are related to the air emissions derived from the diesel generators that will work to provide energy to the workers camps and some construction equipment.</p>	Trucks and vehicles crossing housing areas shall reduce their speed to a maximum of 30 km/h.	Continuously during construction	Construction Contractor
		The vehicles and equipments shall be kept in good maintenance state.	Continuously during construction	
		If generators are used, they shall be located far from the residential areas.	Continuously during construction	
		Spray unpaved areas subject to vehicle movements with non-drinkable water in case dust suspension is visible and considered critical; keep in mind that this activity must not result in the formation of puddles, lead to rutting by equipment or vehicles, tracking of mud onto roads or siltation of watercourses;	Continuously during construction	
		Cover the trucks transporting earth and pulverous materials with tarpaulins;	Continuously during construction	
		Do not store earth and pulverous materials in open air.	If windy conditions are expected during construction	
		Keep diesel generators further away from the workers occupations and residential areas.	Continuously during construction	

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
Landscape and visual aspects	Temporary impacts may be caused due to the circulation of vehicles and machinery, presence of piles of excavated material, storage, borrow and deposit areas	All the construction equipment shall be removed and all the debris shall be collected from all work areas, including RoW, construction camps, pipe lay down yards etc. Measures to restore the landscape like re-cultivation of deposition and passage areas, as well as of the construction and safety strips shall additionally be taken considering the legal restrictions. This means that no deep rooting plants can be re-planted above the pipeline (50 m width safety strip).	After construction works	Construction Contractor
		Re-cultivation of deposition and passage areas, as well as of the construction and safety strips	After construction works	
		Spray unpaved areas subject to vehicle movements with non-drinkable water in case dust suspension is visible and considered critical; keep in mind that this activity must not result in the formation of puddles, lead to rutting by equipment or vehicles, tracking of mud onto roads or siltation of watercourses;	Continuously during construction	
		Cover the trucks transporting earth and pulverous materials with tarpaulins;	Continuously during construction	
		Do not store earth and pulverous materials in open air.	Continuously during construction	
	The establishment of the safety strip will imply vegetation clearing	Continue optimizing the route in such a way to avoid passage through or proximity to forested, orchard and vineyard areas. In particular, the proximity to the landscape reserve Cazimir - Milești in Nisporeni shall be reviewed, i.e., the line shall be deviated in such a way to avoid the fell of trees and disturbances within this reserve.	During the detailed design phase	Construction Contractor
		Any micro-realignment of the pipeline route, or construction of associated facilities outside the 1,000 meters width investigation area, as well as any deviation or construction that implies entering protected areas or forcing the re-location of buildings, shall be subject to the lenders' prior information and approval.		

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
Other fauna	<p>There is a relatively large number of water crossings, which may cause disturbances to aquatic fauna due to direct killing, destruction of spawning sites, sedimentation of the water, etc.</p> <p>Terrestrial fauna may be disturbed during construction due to noise and vibrations; destruction of habitats and nests, direct killing by hunting; injuries or direct killing due to falls into open trenches; etc.</p>	<p>Continue optimizing the route in such a way to avoid passage in the proximity of or through forests and water bodies.</p> <p>Any micro-realignment of the pipeline route, or construction of associated facilities outside the 1,000 meters width investigation area, as well as any deviation or construction that implies entering protected areas or forcing the re-location of buildings, shall be subject to the lenders' prior information and approval</p>	During the detailed design phase	Construction Contractor
		<p>An <b>Aquatic Life Survey</b> shall be undertaken. Its main objectives will be:</p> <ul style="list-style-type: none"> <li>• Determining the presence of any protected species of fish, birds, mammals, amphibians, reptiles, or insects within the water courses to be crossed</li> <li>• Determining fish spawning, feeding, over-wintering or nursery areas</li> <li>• Determine the sensitivities of the water courses to be crossed, and support thereof the development of the Water Crossings Management Plan with temporal and spatial avoidance measures, as well as mitigation measures for each crossing location.</li> </ul> <p>The scope of the Aquatic Life Survey shall be determined by a biologist specialized in fresh water animals, preferably with previous knowledge about the project area. The scope shall clarify which water courses shall be included, and during which time of the year the survey shall be undertaken. The biologist shall use this ESIA as a basis for the planning of her/his work.</p>	Before detailed design is completed, in Spring/Summer time (between March and September) (timing to be confirmed by specialist)	Project Owner (MoE)
		No crossing shall be planned to areas where sensitive habitats and fish spawning, feeding, over-wintering or nursery areas exist (as a result of the Aquatic Life Survey).	During detailed design	Construction Contractor

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
		If the Aquatic Life Survey detects species which are highly sensitive to release of sediments into the water, no wet crossing shall be undertaken up to 1 km upstream of the areas of such species. In such cases, either the crossing is undertaken on another location or a dry ditch method shall be used.	During detailed design	Construction Contractor
		The construction activities shall be limited to the defined construction corridor and vehicle movements and storage of construction material outside of this corridor shall be prohibited	Continuously during construction	Construction Contractor
		Hunting shall be prohibited for all workers	Continuously during construction	
		Select crossing locations where aquatic vegetation is scarce or absent	Continuously during open cut crossings	Construction Contractor
Other flora	Impacts related to the cut of forest trees	Continue optimizing the route in such a way to avoid passage in the proximity of or through forests and water bodies.	During the detailed design phase	Construction Contractor
		Any micro-realignment of the pipeline route, or construction of associated facilities outside the 1,000 meters width investigation area, as well as any deviation or construction that implies entering protected areas or forcing the re-location of buildings, shall be subject to the lenders' prior information and approval.		
		Restrict the felling of trees to the minimum required. Trees can only be felled within the safety corridor and on the alignment of approved access roads.	Continuously during clearing	
		All trees shall be felled toward the construction strip to minimize damage to trees in adjacent areas	Continuously during clearing	
		Do not allow the circulation of vehicles, machinery and workers outside the construction strip and access roads, with the exception of vehicles involved in clearance which are allowed in the safety strip during clearing.	Continuously during construction	

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
	Impacts related to the cut of riparian vegetation	Give the cleared materials to the local inhabitants, if they so desire in case there is no interest from the community, save the materials for disposal.	Continuously during construction	
		Select crossing locations where aquatic vegetation is scarce or absent	Continuously during open cut crossings	
		Disturbed riparian areas will be re-vegetated with conservation grasses or native plant species.	After open cut crossings	
Natural protected Areas	General impacts related to losses of protected flora and disturbances and losses of protected fauna within protected areas	Continue optimizing the route in such a way to avoid passage through or proximity to protected areas. In particular, the proximity to the landscape reserve Cazimir - Milești in Nisporeni shall be reviewed, i.e., the pipeline route shall be deviated in such a way to avoid the fell of trees and disturbances within the reserve. This will avoid any impacts on the protected species listed under the IUCN Red List, as well as those listed under the Moldovan Red Book and other protection instruments.  Any deviations beyond the 1,000 meters width investigation corridor, or that imply the crossing of protected areas or force the re-location of buildings, shall be subject to the lenders' prior information and approval.	During the detailed design phase	Construction Contractor
	A small stream within the protection buffer of the Plaiul Fagului reserve shall be crossed by the pipeline. There is the possibility that Eurasian Otter dens are built in the banks of this small stream, given the presence of this species within the reserve. The crossing may destroy these dens.	As part of the <b>Aquatic Life Survey</b> , the stream banks of the small stream within the protection buffer of the Plaiul Fagului reserve shall be inspected for otter dens (normally a hole on the river bank indicates the presence of a den ca. 1 or 2 meters deep). In case one inhabited den is found, the pipeline shall be deviated to avoid disturbance or destruction of the den or killing/injuries of otters.	Before detailed design is completed, in Spring/Summer time (between March and September) (timing to be confirmed by specialist)	Project Owner (MoE)
	Specimens of Ferruginous Duck may also be present	As part of the <b>Aquatic Life Survey</b> , a visual inspection of the area of the small stream in the protection buffer of	Before detailed design is completed,	Project Owner (MoE)

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
	around the small stream in the buffer of the Plaiul Fagului reserve. The breeding season for this species begins earliest in May and ends in the end of June. The possibility that specimens of this species are present in the area cannot be excluded at present.	the Plaiul Fagului reserve shall be undertaken to detect the presence of specimens of Ferruginous Duck. Although this species may in some cases remain on the breeding ground the whole year round, this inspection shall be preferably undertaken between the months of May and June to detect the eventual presence of this species in the vicinity of the pipeline route.	in Spring/Summer time (between March and September) (timing to be confirmed by specialist)	
		If the presence of Ferruginous Ducks is confirmed, the crossing of the stream shall not be undertaken during the breeding season (May - June), as this may lead to the destruction of nests and eggs which are normally laid on the ground around water features.	During water crossing of the stream in the protection buffer of the Plaiul Fagului reserve	Construction Contractor
	The European Pond Turtle may be found in a variety of semi-aquatic environments, including streams and drainage channels of agricultural lands, both present in the protected buffer of the Plaiul Fagului reserve. During Winter, the turtle hibernates normally on land adjacent to the water features where it lives and reproduces (immediately after the hibernation period). The clearing of the ROW in the vicinity of the stream and irrigation channels within the protection buffer of the Plaiul Fagului reserve during Winter may kill some specimens of the European Pond Turtle.	As part of the <b>Aquatic Life Survey</b> , a visual inspection of the area of the small stream, the drainage channels and the irrigation channels in the protection buffer of the Plaiul Fagului reserve shall be undertaken to detect the presence of specimens of European Pond Turtle.	Before detailed design is completed in Spring/Summer time (timing to be confirmed by specialist)	Project Owner (MoE)
		In case specimens of European Pond Turtle are found, the crossing of the stream and any eventually existing irrigation and drainage channels in the protection buffer of the Plaiul Fagului reserve shall not be undertaken during Winter, when the European Pond Turtle may be wintering underground close to these surface waters.	During water crossing of the stream, drainage, and irrigation channels in the protection buffer of the Plaiul Fagului reserve	Construction Contractor
	The construction works inside the protection buffer of the Plaiul Fagului reserve may imply the fall of trees which	A <b>Bird Survey</b> shall be undertaken. Its main objective will be determining the presence of any protected bird species in the protection buffer of the Plaiul Fagului reserve. This can be done by verifying the presence of	Before detailed design is completed, in Spring/Summer time (between	Project Owner (MoE)

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
	may contain eagle and falcon nests of the following protected species:  Red-footed Falcon Booted Eagle European Honey Buzzard Lesser Spotted Eagle	nests which could be used by the protected species.  The scope of the Bird Survey shall be determined by a biologist specialized in avifauna, preferably with previous knowledge about the project area. The scope shall clarify during which time of the year the survey shall be undertaken. The biologist shall use this ESIA as a basis for the planning of her/his work.	March and September) (timing to be confirmed by specialist)	
	These species that nest inside the reserve, but at present, the existence of nests in the protection buffer of the reserve is not confirmed.	If the presence of specimens of these species is suspected or confirmed, the felling of trees with nests in this area shall be avoided by deviating the pipeline route.	During detailed design	Construction Contractor
		If it is not possible to avoid the felling of trees with nests, the nests shall be relocated to nearby trees in order for the eagles to keep close to their usual feeding area, which is what they normally return to every year.	During construction works within the protection buffer of the Plaiul Fagului reserve	Construction Contractor
		Any works in the proximity to trees bearing nests shall not be undertaken during the breeding season (Spring and early Summer) to avoid the destruction of eggs and juveniles.	During construction works within the protection buffer of the Plaiul Fagului reserve	Construction Contractor
	The construction works inside the protection buffer of the Plaiul Fagului reserve may imply the destruction of ground nests of the following protected species:  Shorteared Owl  This species exists inside the reserve, but the status of presence (migratory, nesting, or wintering) is unclear. At present, the existence of nests in the protection buffer of the reserve is not confirmed.	A <b>Birds Survey</b> shall be undertaken. Its main objective will be determining the presence of any protected bird species in the protection buffer of the Plaiul Fagului reserve. This can be done by verifying the presence of nests which could be used by the protected species.  The scope of the Birds Survey shall be determined by a biologist specialized in avifauna, preferably with previous knowledge about the project area. The scope shall clarify during which time of the year the survey shall be undertaken. The biologist shall use this ESIA as a basis for the planning of her/his work.	Before detailed design is completed, in Spring/Summer time (between March and September) (timing to be confirmed by specialist)	Project Owner (MoE)
		If the presence of Shorteared Owl is confirmed, the crossing of the buffer shall not be undertaken during the breeding season, as this may lead to the destruction of nests and eggs.	During construction works within the protection buffer of the Plaiul Fagului reserve	Construction Contractor



Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
	Falls of animals into open trenches in the vicinity of protected areas; subsequent injuries or entrapment of animals	<p>To prevent animals from falling into open trenches , install wildlife escape ramps from open trenches in sensitive locations, namely when crossing or passing by the reserves and core areas of the NEN (please refer to Maps 1 and 2 in Annex 16.7):</p> <p>Passage through the protection buffer of Plaiul Fagului (Option 1b);  Passage close by the reserve Cazimir - Milești (Option 1b).</p> <p>Initially the escape ramps shall be placed every 1 km where crossing or passing close by the above listed reserves. A walk-through shall be undertaken everyday and any trapped animals shall be carefully released. If the daily walk-through reveals that animals get regularly trapped inside the trenches and cannot escape due to the relatively large distance between escape ramps, these shall be placed every 500 meters.</p> <p>The escape ramps shall be built along the trench in parallel to the trench line.</p>	<p>During trenching</p> <p>During construction works</p>	Construction Contractor
		Limit the lenght of open trench to 10-12 km at any given time. This shall be made not only when constructing nearby reserves, but as a general measure along the entire construction site.	During construction works	Construction Contractor
	<p>Disturbance and injuries to protected animal species that may exist in the protection buffer of the Plaiul Fagului reserve, especially:</p> <ul style="list-style-type: none"> <li>• Speckled Ground Squirell</li> <li>• Bicolored Shrew</li> <li>• Stoat</li> <li>• Pine Marten</li> </ul>	The direct killing of any animal during construction shall be forbidden.	During construction works within the protection buffer of the Plaiul Fagului reserve	Construction Contractor

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
	<ul style="list-style-type: none"> <li>Wild Cat</li> </ul>			
	<p>The buffer of the Plaiul Fagului reserve contains habitats where the protected insect species praying mantis may exist.</p> <p>Application of chemical pesticides can eliminate the whole population of in the application area.</p>	<p>The clearing of the area for construction and maintenance purposes can not be undertaken with chemical pesticides.</p>	<p>During construction works in the whole ROW, but specifically within the protection buffer of the Plaiul Fagului reserve</p>	<p>Construction Contractor</p>
	<p>Beetles take shelter in old trees and their larvae feed on the old and decaying wood. Within the protection buffer of the Plaiul Fagului reserve some trees will be cleared, which may constitute a shelter for the following protected beetle species:</p> <ul style="list-style-type: none"> <li>Forest caterpillar hunter</li> <li>Porthmidius austriacus</li> <li>Euroepan Rhinoceros Beetle</li> <li>Stag Beetle</li> <li>Capricorn Beetle</li> <li>Morimus Funereus</li> <li>Rosalia Longicorn</li> <li>Blue Ground Beetle</li> </ul> <p>The protected species Xylocopa valga (carpenter bee) nests inside the wood of trees with perfectly round</p>	<p><b>A Trees Survey</b> shall be undertaken within the protective buffer of the Plaiul Fagului reserve to:</p> <p>visually evaluate the age of the trees; detect the presence of nests of carpenter bees</p> <p>The Trees Survey shall be undertaken by a specialized biologist, preferably with previous knowledge about the project area. The biologist shall use this ESIA as a basis for the planning of her/his work.</p> <p>In case old trees (especially oak trees) or trees bearing carpenter bees nests are found within the pipeline route, deviate it in such a way to avoid the fell of these trees within the buffer of the reserve Plaiul Fagului.</p> <p>Do not destroy fallen and decaying old trees in the RoW of the pipeline. Remove dead trees to undisturbed places in the vicinity, preferably to the edge of the reserve.</p>	<p>Before detailed design is completed, in Spring/Summer time (between March and September) (timing to be confirmed by specialist)</p> <p>During the detailed design phase</p> <p>During clearing of the ROW in the protection buffer of the Plaiul Fagului reserve</p>	<p>Project Owner (MoE)</p> <p>Construction Contractor</p> <p>Construction Contractor</p>

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
	<p>entrances. The falling of trees bearing nests could cause irremediable damage to the nests.</p> <p>It is not clear at the present if trees within the protective buffer of the reserve could constitute a shelter for these protected species.</p>			
	<p>The construction works inside the protection buffer of the Plaiul Fagului reserve may imply the fall of oak trees which may constitute a shelter for species of protected moth, namely:</p> <ul style="list-style-type: none"> <li>• Giant Peacock Moth;</li> <li>• Oak Hawk Moth.</li> </ul> <p>Both species prefer isolated trees in open landscapes.</p>	<p>The detailed design shall avoid the need to cut down isolated oak trees, i.e., oak trees located in open areas</p>	<p>During the detailed design phase</p>	<p>Construction Contractor</p>
	<p>The construction works inside the protection buffer of the Plaiul Fagului reserve may imply the clearing of plant species which may constitute a shelter for a species of protected moth, namely:</p> <ul style="list-style-type: none"> <li>• Jersey Tiger Moth.</li> </ul> <p>The plant species where this species may take shelter, and which exist within the reserve Plaiul Fagului are the following:</p>	<p>As part of the restoration works, the disturbed land shall be re-seeded with the plant species that occupied the project area before clearing ( except for trees and bushes)</p>	<p>After construction works in the protection buffer of the Plaiul Fagului reserve</p>	<p>Construction Contractor</p>

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
	<p>stinging nettle (<i>Urtica dioica</i>), dead nettle (<i>Lamium purpureum</i>), blue weed (<i>Echium vulgare</i>), raspberry (<i>Rubus ideaus</i>).</p> <p>There is a possibility that specimens of these plant species (and, as therefore, of Jersey Tiger moth) are found within the buffer zone of the Plaiul Fagului reserve.</p>			
	<p>Several protected plant species can be found inside the reserve Plaiul Fagului. There is a possibility that these are found also inside the protection buffer. Due to clearing, these plants will be permanently lost.</p>			
	<p>The construction works inside the protection buffer of the Plaiul Fagului reserve may imply the clearing of plants from the family Umbelliferae (celery, carrot or parsley), which constitute food for the following species of protected butterfly:</p> <ul style="list-style-type: none"> <li>• Scarce Swallowtail;</li> <li>• Old World Swallowtail.</li> </ul> <p>These species live within the reserve Plaiul Fagului, so there is a possibility that they are also found within the protective</p>	<p>The contractor shall assure that stripped topsoil from pasture land is not mixed with stripped topsoil from agricultural land. This will avoid a nutrient mixture which could be disadvantageous for the plants of the family Umbelliferae, of which the protected Old World and Scarce Swallowtail depend.</p>	<p>During construction in the protection buffer of the Plaiul Fagului reserve</p>	<p>Construction Contractor</p>

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
	buffer.			
Ecological corridors	During the construction activities the ecological corridor between the Plaiul Fagului and Codrii reserves will be blocked, due to the presence of workers, machinery and the trenches. This implies a temporary disturbance (a few weeks within the whole project construction) to the movement of animals.	<p>To prevent animals from falling into open trenches, wildlife escape ramps shall be installed where crossing the corridor.</p> <p>Initially the escape ramps shall be placed every 1 km where crossing the ecological corridor. A walk-through shall be undertaken everyday and any trapped animals shall be carefully released. If the daily walk-through reveals that animals get regularly trapped inside the trenches and cannot escape due to the relatively large distance between escape ramps, these shall be placed every 500 meters.</p> <p>The escape ramps shall be built along the trench in parallel to the trench line.</p> <p>Limit the length of open trench to 10-12 km at any given time. This shall be made not only when crossing the ecological corridor, but as a general measure along the entire construction site.</p>	<p>During trenching</p> <p>During construction works</p>	Construction Contractor
Land and property	<p>Temporary/permanent land loss</p> <p>Loss of income due to inability to harvest during construction</p>	<p>Continue optimizing the route in such a way to further avoid the impacts on land and property. In particular, it shall be avoided to affect the small land plots in such a way that these will be rendered useless after the works. This implies that significant portions of each plot shall not</p>	During the detailed design phase	Construction Contractor

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
	Disrupt usage of land	be affected.  Any micro-realignment of the pipeline route, or construction of associated facilities outside the 1,000 meters width investigation area, as well as any deviation or construction that implies entering protected areas or forcing the re-location of buildings, shall be subject to the lenders' prior information and approval.		
		Conduct specific site surveys to collect information on the exact affected areas, respective owners (or project affected people), and determine the compensation mechanisms and costs: <b>Survey of PAPs</b> . It is essential to properly inform and consult with the affected landowners about the compensation measures. The PAPs shall agree with the decisions taken before construction begins.	During the detailed design phase and at least 6 months before construction works begin	Construction Contractor LRF Consultant
		Elaborate a detailed <b>Livelihood Restoration Framework</b> (LRF) and undertake compensation for losses, damages and restriction of access. Please refer to Section 12 of this ESIA for further details.	6 months before construction begins	MoE with support of a LRF Consultant
		The works shall be strictly restricted to the construction strip	Continuously during construction	Construction Contractor
		Do not allow the circulation of vehicles, machinery and workers outside the designated areas	Continuously during construction	
		Measures to avoid soil erosion, mixing, rutting, compaction and pollution shall be applied	Continuously during construction	
		Restoration of the temporary affected land to its preconstruction conditions	Immediately after construction	
		All trees shall be felled toward the construction strip to minimize damage to trees in adjacent areas	Continuously during clearing	
		The construction works on pasture land shall not be undertaken during the grazing season, if the affected area is deemed to impede the pasture activities. This shall be discussed and agreed with the landowners previously.	Before construction works begin	

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
Access	The construction works may temporarily affect the use of the roads, constrain the access to properties and increase the travel time	Elaborate a <b>Traffic Management Plan</b> including measures such as: providing temporary access alternatives; providing community information related to the construction schedule on particular section of roads that are expected to be affected by the works defining a mechanism for liaison with the local traffic management authorities.	One month before construction works begin	Construction Contractor
		The workers camps shall be placed close to the pipeline ROW. This will minimize travel on the public roads while maximizing the usage of the ROW to circulate.		
Utilities	Public utilities which are located under and above ground can be damaged during construction	Detailed survey to identify the utilities along the pipeline route ( <b>Utilities Survey</b> )	During the detailed design phase	Construction Contractor
		Inform the service provider that the works will occur on a certain portion of the pipeline	One week before the works start on a specific location	
Workforce	Impacts related to occupational health and safety, on and off-site accommodation, worker's rights, rules and obligations and employment standards	Have a clear, understandable and accessible human resources policy	One month before construction works begin	Construction Contractor
		Communicate to all workers their working conditions and terms of employment and provide them with pertinent documentation.	During contracting	
		Respect the requirements of Moldova Law 186 and international best practice., considering also emergency prevention, preparedness and response	One month before construction works begin	
		Provide and make accessible a transparent <b>grievance mechanism for workers</b>	Continuously during construction	
		Make all security arrangements compliant with the best international standards	Continuously during construction	
		Provide adequate, timely and regularly updated training and briefings for workers on occupational health and safety	Every time before a worker is engaged or transferred to a new function  Regularly during construction	

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
		Require the workers to use the provided personal protective equipment	Continuously during construction	
		Report and record any accidents, incidents and/or breach of relevant legislation	Continuously during construction	
		Assure that all workers have access to adequate, safe and hygienic basic facilities on-site, with separate facilities for women and men, and that qualified first-aid can be provided	Continuously during construction	
		Assure the rapid availability of trained paramedical personnel, and emergency transport	Continuously during construction	
		Provide workers camps that respect the requirements outlined in Section 10.4 of this ESMP.	Continuously during construction	
		Identify the employment of migrant workers and ensure their treatment is not less favourable than that of no-migrant workers undertaking similar functions. This includes enjoyment of same rights and of equal opportunities and treatment. No physical or psychological coercion on migrant workers, including unnecessary restrictions on movement or retention of worker's identity documents or personal belongings is allowed	Continuously during construction	
Community Health & Safety	Increase of the community exposure to health, safety and security risks (accidents, hazardous materials, misbehavior of security forces, dust, noise, etc.)	Fence the site at the borders of the ROW when in proximity to villages, and place entrance prohibition and other warning signs	When in proximity to villages	Construction Contractor
		securely store unused pipes	Continuously during construction	
		use blowers, vacuums or water to remove dry materials from vehicles avoiding, this way, the deposition of mud or soil on the roads	Continuously during construction	
		Limit the length of open trench to 10-12 km at any given time.	Continuously during construction	
		Follow the <b>Public Consultation and Disclosure Plan</b> (PCDP) prepared for this project (Annex 15.6)	Continuously during construction	
		Grant PAPs free and easy access to an independent and effective grievance mechanism	Continuously during construction	



Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
		Disclose relevant project-related information to stakeholders	Continuously during construction	
		Prevent or minimize the potential for community exposure to hazardous materials	Continuously during construction	
		Control the transport safety by means of a <b>Traffic Management Plan</b> and a range of road safety measures and programs	One month before construction works begin	
		Avoid or minimize adverse impacts due to project activities on air, soil, water, vegetation and fauna and other natural resources	Continuously during construction	
		Prepare accident prevention/emergency preparedness policy/measures	One month before construction works begin	
		Assist and collaborate with the community and the local government agencies in their preparations to respond effectively to emergency situations	Continuously during construction	
		In case security services are provided, assure that those providing security are not implicated in past abuses, are adequately trained, have an appropriate conduct towards the citizens and other workers, and act within the applicable law	Before contracting security personnel	
		Proximity to villages shall be thought as enough to provide opportunity for the workers to use the community services on their free time (supermarkets, restaurants, etc.), but not enough to disturb the population with noise and security lights at night;	During the detailed design phase	
		A <b>Workers' Code of Conduct</b> shall be developed and the workers shall be thereof informed. The Code of Conduct shall contain provisions such as: <ul style="list-style-type: none"> <li>“good neighborhood” principle, e.g., the workers shall not cause disturbances to any surrounding village related to noise, littering, or vandalism;</li> <li>any potential or real conflicts with the local community shall be immediately reported to the management at site, and resource to direct confrontation shall be prohibited;</li> </ul>	One month before construction works begin	

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
		<ul style="list-style-type: none"><li>the religious, cultural, and social activities of the local communities shall not be disturbed. This is specially important in the case that the workers do not share the same cultural, religious and social background (ex., migrant workers);</li><li>etc.</li></ul>		
Cultural heritage	Damages to known and unknown archaeological sites, buildings and objects	Conduct an <b>Archaeological Survey</b>	Six months before construction works begin	MoE by hiring archaeologists holding valid archaeological research licenses
		Obtain relevant permits from the National Archeological Agency of the Ministry of Culture.	One month before construction works begin	MoE
		Consultation with the local communities shall be undertaken to determine if small objects or sites related to cultural traditions exist along the project area (like crosses placed in specific areas to mark a funeral procession, among others). The options (deviation of the pipeline route, moving of the objects) shall be discussed with the local population.	During detailed design	Construction Contractor
		Establish a <b>Chance Find Procedure</b> which should contain measures such as: <ul style="list-style-type: none"><li>ceasing work as soon as historical and cultural sites, buildings, or objects are encountered during earthworks or other construction activities;</li><li>providing relevant information to the Ministry of Culture. The Ministry will then determine the value of the historic/archaeological monuments and provide guidance on if and how to proceed with the construction.</li></ul>	One month before construction works begin	Construction Contractor
OPERATION PHASE				
Soil and water	The maintenance of the pipeline will imply the usage of a cleaning pig to clean any residues resulting from eventual condensation of the gas. Depending on the	To avoid spills of the residue, a holding tank or a catcher shall be planned that will receive this residue when the pig reaches the receiver station.	During pigging	Operation Contractor
		The pigging residue should be discharged only after water-quality testing to ensure that it meets discharge criteria	After pigging and before discharge	

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
	disposal method of the liquid stream resulting from pigging, soil or the nearest water resources may be affected.			
Air quality	Air emissions due to emergency or maintenance related flaring	Keep the pipeline in a good maintenance state.	Continuously during operation	Operation Contractor
Flora and Protected areas	Removal of trees grown within the safety strip at regular intervals causes direct impacts on flora and protected areas and may affect neighboring areas	In controlling vegetation in the safety strip, only biological and mechanical control measures shall be used.	During regular clearing of the safety strip	Operation Contractor
Agricultural assets	Partial destruction of agricultural crops could occur during maintenance works and in case of accidents.	Conduct the works with due care	Continuously during maintenance works	Operation Contractor
		Inform the landowner when maintenance works need to be undertaken	Before maintenance works	Operation Contractor
		Compensate the landowner for any losses of agricultural assets	In the event of losses of crops	MoE Operation Contractor
		Keep a link for register of grievances on their websites or customary means.	Continuously during operation	MoE Operation Contractor
Occupational Health & Safety	Maintenance/repair of the pipeline, or excavation by non-gas utility personnel, may result in accidental rupture or gas leakage	Training of employees and contractor personnel in occupational health and safety procedures	Every time before a worker is engaged or transferred to a new function  Regularly during operation	Operation Contractor
		Provision of appropriate tools and equipment	Regularly during operation	
		Identification and location of existing gas and other buried utility infrastructure	Prior to excavation	

Component	Negative Impact	Mitigation and/or compensation measures		
		Description	Timing and/or frequency	Responsibility for implementation
		Removal of sources of ignition	Prior to gas venting for maintenance and repair activities	
		Purging of gas from pipeline or pipe components	Prior to welding or cutting activities	
		Measures for emergency prevention, preparedness and response	Regularly during operation	
	Damages to structures (roads, railways) and risks for human life in case of a gas leakage followed by an explosion	Design, construct, and operate the project according to international standards for the prevention and control of fire and explosion hazards	At project phases	Construction Contractor Operation Contractor
		Establish an <b>Emergency Prevention, Preparedness and Response plan</b> involving appropriate public authorities. Part of the plan shall be the establishment of a telephone notification system.	Six months before the operation begins	Operation Contractor
		Provide a pipe location service	Regularly during operation	Operation Contractor

**Table 10-2: Environmental and Social Management Plan for the Ungheni-Chisinau pipeline project - Monitoring measures**

Component and negative impact	Monitoring measures		
	Description	Timing and/or frequency	Responsibility for implementation
<b>CONSTRUCTION</b>			
General requirement	Analysis and approval of the HSE Plan for construction	One month before the works begin	MEPIU/MoE
Soil erosion, mixing, compaction, rutting and waste deposition	<b>Compliance monitoring:</b>		
	Analysis and approval of the Soil Management and Erosion Control Plan	One month before the works begin	MEPIU/MoE
	Analysis and approval of the Waste Management Plan	One month before the works begin	MEPIU/MoE
	Visual inspection of the works and installed structures	Continuously during construction	Construction Contractor's HSE Team
	Analysis and approval of the Erosion and Landslides Survey results	During the detailed design phase	MEPIU/MoE
	<b>Effects monitoring:</b>		
	Monitor the working areas for erosion, mixing, rutting, compaction and waste deposition	Immediately after construction works are finished on each particular section	Construction Contractor's HSE Team
	Verify the success of any revegetation measures undertaken to avoid post-construction erosion	Six months after construction	MoEn Environmental Inspections
Water resources may be polluted and over used by run-off, inadequate disposal, hydrotesting water, and crossing	Provide information on the extent and severity of the damages to agricultural soils.	After the first and second growing seasons	MoEn Environmental Inspections
	<b>Compliance monitoring:</b>		
	Analysis and approval of the Spill Prevention and Cleanup Plan	One month before the works begin	MEPIU/MoE
	Analysis and approval of the Water Crossings Management Plan	One month before the works begin	MEPIU/MoE
	Analysis and approval of the Hydrological Survey results	During the detailed design phase	MEPIU/MoE
	Visual inspection of the works and installed structures	Continuously during construction	Construction Contractor's HSE Team
	Verify the obtainance and validity of the water withdrawal permit (in case one is necessary to source water for hydrotesting of the pipeline)	One month before the works begin	MoEn Environmental Inspections

Component and negative impact	Monitoring measures		
	Description	Timing and/or frequency	Responsibility for implementation
	Monitor the hydrostatic test water quality to meet the applicable discharge criteria (Section 4.4 or others as per Environmental Permit)	Immediately before usage and immediately before discharge of hydrotesting water	Construction Contractor's HSE Team
	<b>Effects monitoring:</b>		
	Monitor the areas subject to discharge of hydrotesting water for erosion or flooding	Immediately after hydrotesting is finished on each particular section	Construction Contractor's HSE Team
	Verify the success of any revegetation measures and restoring measures for water banks undertaken	Six months after construction	MoEn Environmental Inspections
High noise levels and air emissions in the areas surrounding the construction sites	<b>Compliance monitoring:</b>		
	Visual inspection of the works and installed structures	Continuously during construction	Construction Contractor's HSE Team
Impacts on landscape due to the presence of vehicles and machinery, generation of dust and vegetation clearing	<b>Compliance monitoring:</b>		
	Analysis and approval of the detailed design	During the detailed design phase	MEPIU/MoE
	Visual inspection of the works	Continuously during construction	Construction Contractor's HSE Team
	<b>Effects monitoring:</b>		
	Verify the success of any revegetation measures	Six months after construction	MoEn Environmental Inspections
Disturbances to fauna due to noise and vibrations, destruction of habitats and nests, hunting, killing, falling, disruption of fish spawning	<b>Compliance monitoring:</b>		
	Analysis and approval of the detailed design	During the detailed design phase	MEPIU/MoE
	Analysis and approval of the Aquatic Life Survey	During the detailed design phase	MEPIU/MoE
	Visual inspection of the works	Continuously during construction	Construction Contractor's HSE Team
Losses of forest trees and riparian vegetation	<b>Compliance monitoring:</b>		
	Analysis and approval of the detailed design	During the detailed design phase	MEPIU/MoE
	Visual inspection of the works	Continuously during construction	Construction Contractor's HSE Team
	<b>Effects monitoring:</b>		

Component and negative impact	Monitoring measures		
	Description	Timing and/or frequency	Responsibility for implementation
	Verify the success of any riparian revegetation measures	Six months after construction	MoEn Environmental Inspections
Disturbances of the natural environment within the natural protected areas	<b>Compliance monitoring:</b>		
	Analysis and approval of the detailed design	During the detailed design phase	MEPIU/MoE
	Analysis and approval of the Birds Survey results	During the detailed design phase	MEPIU/MoE
	Analysis and approval of the Trees Survey results	During the detailed design phase	MEPIU/MoE
	<b>Effects monitoring:</b>		
	Visual inspection of the works and the installed structures	Continuously during construction	Construction Contractor's HSE Team
	Visually inspection of the trenches for entrapped animals	Continuously during construction	Construction Contractor's HSE Team
Blockage of ecological corridors	<b>Compliance monitoring:</b>		
	Visual inspection of the works and the installed structures	Continuously during construction	Construction Contractor's HSE Team
	<b>Effects monitoring:</b>		
	Visually inspection of the trenches for entrapped animals	Continuously during construction	Construction Contractor's HSE Team
Land and property: losses, disruption of usage, loss of income	<b>Compliance monitoring:</b>		
	Analysis and approval of the detailed design	During the detailed design phase	MEPIU/MoE
	Analysis and approval of the detailed LRF	Six months before construction	MEPIU/MoE MoEn
	Visual inspection of the works and the installed structures	Continuously during construction	Construction Contractor's HSE Team
	Monitoring the LRF implementation	During LRF implementation	LRF Consultant
	Monitoring the grievance mechanism	During LRF implementation	LRF Consultant
Temporary restrictions of access	<b>Compliance monitoring:</b>		
	Analysis and approval of the Traffic Management Plan	One month before the works begin	MEPIU/MoE
Damages to public utilities located under ground	<b>Compliance monitoring:</b>		
	Analysis and approval of the Utilities Survey results	During the detailed design phase	MEPIU/MoE
Impacts related to occupational health and	<b>Compliance monitoring:</b>		
	Visual inspection of the works, working conditions, personal protective equipment used and the installed structures and facilities	Continuously during construction	Construction Contractor's HSE Team

Component and negative impact	Monitoring measures		
	Description	Timing and/or frequency	Responsibility for implementation
safety, on and off-site accommodation, worker's rights, rules and obligations and employment standards	Monitoring the workers grievance mechanism	Continuously during construction	Construction Contractor's HSE Team
	Verify the training records	Continuously during construction	Construction Contractor's HSE Team
	<b>Effects monitoring:</b>		
	Verify the accidents, incidents and breach of legislation reports	Every 3 months during construction	MEPIU/MoE Raional Labour Inspections
Community exposure to health, safety and security risks (accidents, hazardous materials, misbehavior of security forces, dust, noise, etc.)	<b>Compliance monitoring:</b>		
	Monitoring the community grievance mechanism	Continuously during construction	Construction Contractor's HSE Team
	Verify the reports which disclose information about grievances received and the project to the stakeholders	Every 3 months during construction	MEPIU/MoE MoEn Environmental Inspections
	Visual inspection of the works	Continuously during construction	Construction Contractor's HSE Team
	<b>Effects monitoring:</b>		
	Verify the accidents, incidents and breach of legislation reports	Every 3 months during construction	MEPIU/MoE Centre for Public Health
Damages to known and unknown cultural heritage sites	<b>Compliance monitoring:</b>		
	Analysis and approval of the Archaeological Survey results	During the detailed design phase	MEPIU/MoE National Archaeology Agency
	Verify the obtainance and validity of the permit from the National Archaeology Agency	One month before the works begin	MoEn Environmental Inspections
	Verify any Chance Find Procedure reports	In case of chance finds	National Archaeology Agency
<b>OPERATION</b>			
General requirement	Analysis and approval of the HSE Plan for operation	One month before the operation begins	MEPIU/MoE
The liquid stream resulting from pigging may affect soil or the nearest water resources	<b>Compliance monitoring:</b>		
	Visual inspection of the works and the installed structures	During pigging	Operation Contractor's HSE Team
	Monitor the pigging residue to meet the applicable discharge criteria	Immediately before discharge of pigging residue	Operation Contractor's HSE Team
Air emissions	<b>Effects monitoring:</b>		



Component and negative impact	Monitoring measures		
	Description	Timing and/or frequency	Responsibility for implementation
due to emergency or maintenance associated flaring	Monitor NOx in the vicinity of the flaring area (200-500 m)	24 hours each time flaring is carried out after pigging or maintenance works	Operation Contractor's HSE Team
Removal of trees within the safety strip	<b>Compliance monitoring:</b>		
	Visual inspection of the works	During maintenance clearing	Operation Contractor's HSE Team
Partial destruction of agricultural crops during maintenance works and in case of accidents.	<b>Compliance monitoring:</b>		
	Visual inspection of the works	During maintenance	Operation Contractor's HSE Team
	Monitoring the grievance mechanism	Continuously during operation	Operation Contractor's HSE Team
Accidental rupture or gas leakage during maintenance/repair of the pipeline, or excavation by non-gas utility personnel	<b>Compliance monitoring:</b>		
	Visual inspection of the works, working conditions and the installed structures	Continuously during construction	Operation Contractor's HSE Team
	Verify the training records	Continuously during construction	Operation Contractor's HSE Team
	<b>Effects monitoring:</b>		
	Verify the accidents, incidents and breach of legislation reports	Every 6 months during operation	MEPIU/MoE Raional Labour Inspections
Damages to structures (roads, railways) and risks for human life in case of a gas leakage followed by an explosion	<b>Compliance monitoring:</b>		
	Analysis and approval of the Emergency Prevention, Preparedness and Response plan	Six months before the operation begins	MEPIU/MoE Centre for Public Health
	<b>Effects monitoring:</b>		
	Verify the accidents, incidents and breach of legislation reports	Every 6 months during operation	MEPIU/MoE Centre for Public Health

## 10.4 Construction workers camps

Due to the requirements of the IFIs regarding the procurement for the project, a Europe-wide tender will be undertaken. As therefore, there is no guarantee that the construction of the pipeline will be procured to a Moldovan company. In addition, there are only a few qualified welders in the country. It is as therefore expected that a both foreign and national workers will collaborate in the project's construction.

It is estimated that around 50 workers will be necessary in total for the construction of the pipeline, meaning that small camps shall be needed. The number and location of workers camps shall be defined by the construction contractor once manpower and logistics planning is completed. For the ESIA, it is estimated that 2 camps will be necessary for the whole extension of the pipeline, one every 60 kms.

The requirements to be followed by the construction contractor in the planning and management of the workers camps have been described throughout Section 8 and in the ESMP table. These are summarized as follows.

### 10.4.1 IFIs' requirements

The EIB Environmental and Social Standard 9 on Occupational and Public Health, Safety and Security (EIB, 2013) defines the standards desired for sanitary facilities and living quarters. The EBRD Performance Requirement 2 on Labour and Working Conditions (EBRD, 2008) defines standards to be respected where the client provides accommodation for workers. In addition, the guidance note "Workers' accommodation: processes and standards" (IFC/EBRD, 2009) sets forth good industry practice. Based on these standards and guidance, the construction contractor for the Ungheni-Chisinau pipeline project shall:

- ensure that all project workers have access to adequate, safe and hygienic basic facilities, if living on-site and that qualified first-aid can be provided at all times;
- provide basic services including water, drinking water and sanitation;
- provide availability of medical care - in the project's case, this implies provision of communication means to the nearest hospital for cases when first-aid help is not enough to guarantee the worker's care
- provide workers' accommodation quarters that meet the minimum size standards, i.e, 4 to 5.5 m<sup>2</sup> per resident, with a minimum ceiling height of 2.10 meters; in collective rooms, a maximum of 8 workers is recommended.
- provide workers' accommodation quarters that meet hygiene standards (including adequate ventilation; heating; water supply for drinking, cooking, bathing, and laundry purposes; toilet facilities; sewage and waste disposal facilities), and respect basic living needs.

- provide access to cooking/meal facilities.
- ensure that food handling facilities comply with food hygiene regulations.
- not unduly restrict the workers freedom of movement to and from the camps.

#### 10.4.2 Other requirements

- Two worker camps are suggested with a view to minimize travel requirements and safety risks for the workers and the population, as well as to maximize productivity;
- Place the camps close to the pipeline ROW: this will minimize travel on the public roads while maximizing the usage of the ROW to circulate;
- The camps shall not be placed on agricultural land, or land occupied with forest, orchards or vineyards. Instead, pasture land not close to water courses shall be preferably selected.
- Proximity to villages shall be thought as enough to provide opportunity for the workers to use the community services on their free time (supermarkets, restaurants, etc.), but not enough to disturb the population with noise and security lights at night;
- All workers shall be educated on “good neighbourhood” policy, to avoid causing disturbances to any surrounding village, for example related to noise;
- Separate quarters for man and women shall be provided;
- Waste shall be managed on site so as to avoid environmental pollution - the Waste Management Plan to be prepared as part of the HSE Plan for construction shall include measures for waste management on the construction camps;
- When the camps are no longer necessary, they shall be decommissioned and the landscape shall be restored to the pre-construction levels. This may imply descompaction of the soil, replanting with native vegetation, cleaning of any spilled garbage, etc.

## **11. Public and Stakeholder Engagement**

A draft final Public Consultation and Disclosure Plan (PCDP) has been elaborated for the Ungheni-Chisinau Pipeline Project and is available in Annex 16.6. The present Section makes a summarized reference to the main points of the PCDP. For further information, the attached detailed plan shall be consulted.

The PCDP describes the strategy and program to be implemented for engaging with the stakeholders of the project in a culturally and timely appropriate manner. The goal is to ensure the timely provision of relevant and understandable information and to create a process that provides opportunities for stakeholders to express their opinions, aspirations and suggestions about environmental measures, land acquisition and social impacts of the project, and that allows the government of Moldova to consider and respond to them.

The planning of the stakeholder engagement activities for the project has been made under consideration of the national EIA Law and the requirements of the IFIs EBRD and EIB.

Stakeholders are those who will be or are likely to be directly or indirectly affected, positively or negatively, by a project (commonly referred to as project-affected people or project-affected communities), as well as those who might have an interest in, or may influence, the project (the “interested parties”) (EIB, 2013; EBRD, 2008).

### **11.1 Main responsibilities**

The implementation of the PCDP is the responsibility of the project’s developer or initiator, the Ministry of Economy. This implies the review and monitoring of the implementation of the PCDP, as well as the organization of the public engagement activities (disclosure of reports and other info; public debates; answer to comments; liaison with Tier-1 and Tier-2 governments).

The responsible authority as per the Law Nr. 86 on EIA is the Ministry of Environment (MoEn). The MoEn shall review and issue its opinion and/or approval to the documents submitted by the MoE related to the EIA process. It shall in addition overview the stakeholder engagement process.

### **11.2 Planned and undertaken engagement activities**

Different information disclosure and consultation activities have been applied in the project area.

During the preparation of the pre-feasibility study (Fichtner, 2014), and the Inception (Scoping) study (Fichtner, 2015), consulting and information disclosure activities with some stakeholder groups have been undertaken.

Members of the private sector, government, scientific community and the financing institutions have been consulted in this initial phase to discuss technical, design, legal, policy and environmental issues. The feedback from these meetings has been incorporated into the studies undertaken by Fichtner up to now.

In the beginning of February 2015 the organization and planning of the EIA and the feasibility study have started. Fichtner has been involved in group meetings undertaken for this purpose in Chisinau. After these meetings, the agenda for undertaking the EIA activities has been agreed and the project's initiator (MoE) and responsible authority (MoEn) undertook some disclosure activities according to the legal requirements of the new EIA Law.

Other disclosure and consultation activities are planned to be undertaken in the project area. Table 11-1 and Table 11-2 describe generally these activities, as well as those already undertaken.

**Table 11-1: Information disclosure activities planned/undertaken for the project**

When	What	Status	How
Disclosure of information during the EIA preparation	Notification of the project to the authorities and respective public disclosure;	Undertaken in 17.02.2015	Newspapers and radio  Internet  Public placement of hard copies of the project documents
	Disclosure of the results of the preliminary assessment of the planned activities;	Undertaken in 25.02.2015 and again in 04.03.2015	
	Disclosure of the EIA Program/ToR;	Undertaken in March and April 2015	
	Disclosure of the draft EIA Report/EIA Documentation and respective Executive Summary.	To be undertaken	
Disclosure of information during construction	The purpose and nature of the construction activities; The start date and duration of the overall construction works and of specific operations (terrain clearing, transport of heavy components, etc.); Potential impacts; Information on whom to contact if there are concerns/complaints related to the contractor; Information related to the management of the environmental and social matters (application of measures, monitoring efforts and results);	To be undertaken	Random disclosure  Presentations during public consultation meetings/public debates  Billboards

When	What	Status	How
	Answer to grievances.		
Disclosure of information during operation	In case the operator of the pipeline prepares an Emergency Preparedness and Response Plan, this shall be disclosed to the employees and communities so that all stakeholders; Undertake a regular communication of the company's environmental and social performance; Maintain the grievance mechanism.	To be undertaken	

**Table 11-2: Public Consultation activities planned/undertaken for the project**

When	What	Status	How
Public consultation during the EIA preparation	The draft EIA ToR/Program	Undertaken in March and April 2015	Online and written consultation (publication in newspapers, on official websites, and availability of hard copies)
	The draft EIA Report	To be undertaken	On site surveys (socio-economic baseline survey)
			Public meetings/debates
Public consultation during construction and operation	Keep functioning grievance mechanisms	To be undertaken	Nomination of community liaison personnel Suggestion boxes in public locations Visible billboards Official web-page of the developer

### 11.3 Public's opinion on the project

About 84% of the population interviewed during the socio-economic baseline survey (Section 7.3) expressed good attitude towards the project, and accepted it as an important component of development for the whole country and for their district.

Almost 16% of the population expressed their acceptance relating to the project but at the same time having concerns regarding involuntary land acquisition and related changes in their economic activity and social conditions (well-being, income, living conditions).

## **11.4 Public Participation Report**

The Law No. 86 on Environmental Impact Assessment states that the project's developer shall prepare a public participation report which shall be an integral part of the EIA Documentation/report (Article 21). This report shall be generated following the public debates and the written comments received from the stakeholders and general public during the EIA process.

The public participation report shall be submitted to the competent authority within 50 days after the EIA draft report has been presented to the public.

## 12. Resettlement Policy Framework

Projects often necessitate land acquisition, expropriation and/or restrictions on land use, resulting in the temporary or permanent resettlement of people from their original places of residence or their economic activities or subsistence practices. When affected persons and communities do not have the choice to refuse such displacement, this process is known as **involuntary resettlement** (EIB, 2013).

Involuntary resettlement is associated with loss of housing, shelter, income, land, livelihoods, assets, access to resources and services, among others. These losses occur as a consequence of declaring a public purpose, and refer to: (a) physical displacement (i.e. physical relocation of residence or loss of shelter), and/or (b) economic displacement (i.e. loss of assets or access to assets that leads to loss of income sources or means of livelihood) as a result of project-related land acquisition or restriction of access to natural resources (EIB, 2013).

The Ungheni-Chisinau pipeline project will generate involuntary economical displacement. No physical displacement will be necessary.

The European Bank for Reconstruction and Development (EBRD) and the European Investment Bank (EIB) are involved in the Ungheni-Chisinau pipeline project as international financing institutions (IFIs). This implies that their guiding principles or standards relating to involuntary resettlement shall be followed in the project. These have been described in Section 4.3.

Both financing institutions mention the need to develop a plan to ensure that the project affected persons (PAPs) are informed about the project and their resettlement related impacts, have the right to give their opinion on the matter, and receive timely and fair compensation for any assets lost, either temporarily or permanently. The EIB names this plan “Resettlement Action Plan” (RAP) (whether there is physical or economical displacement), and the EBRD names it “Livelihood Restoration Framework” (LRF) (for the cases when only economical displacement is expected). For the sake of simplicity, the designation “Livelihood Restoration Framework” is adopted in this report.

Given the linear nature of the Ungheni-Chisinau pipeline project, only when the detailed design is available it will be possible to prepare a detailed Livelihood Restoration Framework, as only then the exact routing and associated economical impacts will be known in detail. In the present project stage, this ESIA presents instead a **Draft Resettlement Policy Framework (RPF)**. The future LRF shall be prepared by the MoE once the detailed design of the project is available based on the Draft RPF.

The present Draft Resettlement Policy Framework describes:



- the impacts of the involuntary economical resettlement of the project (Section 12.1);
- the associated legal framework, including any gaps with the IFIs' requirements (Section 12.2);
- the procedures that are followed to identify, evaluate and compensate the impacts (Section 12.4);
- the entitlements of affected persons (Section 12.4);
- the resettlement costs (Section 12.4.4);
- the actions to be undertaken during all phases of the resettlement (Section 12.5);
- the disclosure, consultation and participation principles (Sections 12.3 and 12.5), including the grievance mechanism to be established (Section 12.7);
- the responsibilities for undertaking and monitoring resettlement (Sections 12.7 and 12.9).

## 12.1 Resettlement impacts of the project

The Ungheni-Chisinau pipeline project will cross agricultural areas, pasture land, forests and water features. No residential areas, industrial sites and public or private buildings will be affected by the pipeline or in any way by the construction works. This implies that the project will not conduct to physical displacement (relocation or loss of shelter), but exclusively to economical displacement (loss of assets or resources, and/or loss of access to assets or resources that leads to loss of income sources or means of livelihood).

During construction, a temporary working strip with a total width of 16 meters will be necessary where opening of trenches and deposition of some materials is made, and construction vehicles circulate. Considering this strip and the length of the selected route Option 1b (119.95 km), the area of land which will be temporarily necessary for the construction activities is 192 ha (Section 8.1).

On the **construction strip**, the soil will be cleared of all vegetation, independently of its nature. This implies that ephemeral agricultural crops (vegetables and cereals), perennial economical plants (orchards and vineyards), pastures, and forest trees (protected and non-protected) will be affected. Ephemeral agricultural crops and pastures will be affected only during construction, but forest trees, orchards and vineyards will not be re-planted.

To allow the operation of the pipeline, a 50 meters wide **safety strip** or Right of Way (ROW) will be necessary. Considering this strip and the length of the selected route Option 1b (119.95 km), the area of land which will be permanently necessary for the ROW is ca. 600 ha.

Above the safety strip, all forest trees, orchards and vineyards need to be cleared (adding to the clearing undertaken during construction). This is due

to the deepness of their roots, which could affect the physical integrity of the pipe. Agricultural crops and pastures can remain or be re-planted within this strip.

Table 12-1 summarizes the area of ephemeral plantations and pastures which will be temporarily affected for establishment of the construction strip, as well as the area of forests, orchards and trees which will be lost for establishment of the safety strip. These numbers are based on the results presented in Sections 8.1.1.1, 8.1.2.1 and 8.1.3.1.

**Table 12-1: Impacted areas due to the establishment of the construction and safety strips**

Type of land	Temporary impacts - construction strip		Permanent impacts - safety strip		
	Ephemeral plantations	Pastures	Forests	Orchards	Vineyards
Area affected [ha]	116.0	19.8	39.4	46.2	38.4

The construction of the **above ground facilities** (block valve stations, pigging facilities and gas pressure regulation stations) implies in addition losses of land (Table 12-2).

**Table 12-2: Impacted areas due to the construction of the above-ground facilities**

Facilities	Number	Area	Total area	Type of land
Block valve stations	5	0.01 ha each	0.05 ha	Privately owned Assumed pasture land
Pigging facilities	6	4 facilities within the area of the GPRSs: 0 ha considered Plus 2 facilities: 0.01 ha each	0.02 ha	Privately owned Pasture land
GPRSs	2	GPRS #2: 0.08 ha GPRS #3: 3 ha	3.08 ha	State owned
<b>TOTAL AREA privately owned</b>			0.07 ha	
<b>TOTAL AREA state owned</b>			3.08 ha	

At the moment, it is not possible to determine where the block valve stations will be located and, as therefore, which type of land will be lost for these facilities. It is assumed the best case scenario, that is, that only land without agricultural or other economical crops will be used with this purpose in order to reduce the impacts and the compensation costs.

Four pigging facilities are predicted to be located within the areas of the gas pressure regulation stations (new GPRS #2 and new GPRS #3). Two additional pigging facilities shall be constructed: one in the tie-in to the existing Iasi-Ungheni interconnector, and one in one of the tie-ins to the Chisinau network. For each of these facilities, an area of 100 m<sup>2</sup> (0.01 ha) is necessary to be made available. For those located within the GPRS, additional acquisition of land is not necessary.

The new GPRS #2 will have approximately 800 m<sup>2</sup> (0.08 ha) of land area. An operation/administration/maintenance (OAM) complex shall be constructed at the area where GPRS #3 will be located including: building(s) for offices, the dispatch centre, laboratories, repair and maintenance workshops, warehouses, and garage. Emergency stocks of pipes and parking area for vehicles and machinery will need outdoor areas. Altogether an area of 3 ha is envisaged for the complex.

## **12.2 Legal framework for resettlement**

The legal framework of Moldova for land acquisition and compensation has been thoroughly described in Section 4.1.2. The related legal documents are:

- Land code Nr. 828-XII (25.01.1991);
- Forest code Nr. 887-XIII (21.06.1996) and amendments;
- Law Nr. 247-XII on state land management, state cadastre and land monitoring (22.12.1992);
- Law Nr. 1308 on normative price for land and sale/purchase procedure (25.07.1997);
- Law Nr. 488 on expropriation for publicly important purposes (08.07.1999);
- Law Nr. 123 on Natural Gas;
- Government Decree Nr. 1451 on approval of provisions for procedure of land allotment, alteration of use and land exchange (24.12.2007);
- Government Decree Nr. 958 on temporary methodology of evaluation of estate/land, 04.08.2003.

The policies of the International Financing Institutions which are applicable to resettlement issues are:

- EBRD Performance Requirement 5 - Land Acquisition, Involuntary Resettlement and Economic Displacement (EBRD, 2008)
- EIB Environmental and Social Standard 6 - Involuntary Resettlement (EIB, 2013).

These policies are summarized in Section 4.3.

### 12.2.1 Gap analysis

The national legislation described in Section 4.1.2 does not fully comply with the requirements of the IFIs, described in Section 4.3. The main gaps are presented in Table 12-3 below.

**Table 12-3: Gap analysis - international vs national requirements for resettlement**

Subject	IFIs requirements	National legislation requirements	Gap	Situation in the project area	Applicable requirement
Land owners without formal land titles but with a claim to the land	<p><u>EBRD PR 5:</u> This type of PAPs shall be provided replacement property (for example, agricultural or commercial sites) of equal or greater value, or cash compensation at full replacement cost where appropriate</p> <p><u>EIB ESS 6:</u> These type of PAPs are eligible for compensation for land.</p>	<p>For <u>lost crops</u>, the crop owner is entitled to compensation, even if he/she does not have a formal title</p> <p>For <u>lost land</u>, only those with formal title may be compensated. However, it is possible for an informal owner with a legitimate claim to the land to obtain a title. He or she shall for this purpose register their land. The register may take 3 to 6 months to be completed and needs to be ready in time for the budgeting of the LRF.</p>	The national legislation does not predict compensation for informal land owners. However, it gives the possibility for these to obtain a formal title. Those with formal land title can then be compensated.	Likely to be present. After the Soviet Union has been dismantled, the people received the land they have been working on. However, due to reasons still not clear, some of these owners never received or applied for a formal land title.	International and national requirements apply: informal land owners with a valid claim to the land shall register their land. This process shall be completed before the construction works begin. The MoE shall provide the necessary support for acceleration of the register process if needed in order to allow for a timely payment of the compensation (i.e., before the works begin).
People who occupy the land but have no formal or informal title, and no recognizable claim to it (such as squatters)	<p><u>EBRD PR 5:</u> Compensate for lost assets (such as crops, irrigation infrastructure and other improvements made to the land) other than land, at full replacement cost.</p> <p><u>EIB ESS 6:</u> This type of PAPs shall be provided resettlement assistance in lieu of compensation for the land they occupy, and other assistance, as necessary. Such affected persons shall not be compensated for land but for their land improvements or structures, such as houses and/or small businesses. Resettlement</p>	<p>For <u>lost crops</u>, the crop owner is entitled to compensation, even if he/she does not have a formal title.</p> <p>For <u>lost land</u>, no provision in the national legislation exists for such cases.</p>	<p>The national legislation does not predict compensation for lost infrastructures and other improvements made to the land by PAPs without a land title and a claim. Resettlement assistance is also not foreseen.</p> <p>Both the national and the international requirements refer that no land shall be compensated in these</p>	Possibly not present. If squatters and similar PAPs exist, there is a possibility that their crops are affected. However, no other physical infrastructure/improvements to the land made by these PAPs shall be affected.	International requirements apply: if informal land owners without a recognizable claim are affected, they shall be compensated for lost assets other than land (in principle only crops). Resettlement assistance shall be provided if necessary.

Subject	IFIs requirements	National legislation requirements	Gap	Situation in the project area	Applicable requirement
	assistance can consist of land, cash, jobs, or other forms of assistance.		cases.		
Persons who encroach on the area after the cut-off date	<p><u>EBRD PR 5:</u> Assets created, encroached or acquired by individuals or groups after the cut-off dates will not be eligible for compensation.</p> <p><u>EIB ESS 6:</u> Not entitled to compensation or any other form of resettlement assistance.</p>	No mention of a cut-off date in the national legislation.	The national legislation does not predict the establishment of a cut-off date.	It is not possible to determine whether people will encroach the area after the cut-off date, but the risk is deemed as low.	International requirements apply: a cut-off date shall be proposed for the project. This shall be defined as the date of the beginning of the detailed census of PAPs (see row below). No compensation shall be provided to persons encroaching the area after the cut-off date.
Census of PAPs	<p><u>EBRD PR 5:</u> Where involuntary resettlement is unavoidable, the client will engage a suitably qualified specialist to carry out a census and a socio-economic baseline assessment within a defined affected area. The census and socio-economic baseline assessment will identify the persons who will be displaced (fully or partially) by the project, determine who will be eligible for compensation and assistance and, by setting a cut-off date, discourage inflow of people who are ineligible for these benefits.</p> <p><u>EIB ESS 6:</u> The promoter is required to carry out a census and a socio-economic baseline survey to establish the number of people to be displaced,</p>	<p>No provision in the national legislation exists.</p> <p>Although not mentioned in the law, a detailed survey of the PAPs is undertaken to calculate the exact compensation costs and identify the land owners. The institution empowered by Government of Moldova to perform land acquisition or expropriation controls and monitors the survey of PAPs.</p>	A formal gap between the requirements of the IFIs and the national law exists, as this one does not mention or regulate the census of PAPs. However, the census is undertaken.	There are PAPs in the area, whose location and number will be assessed in detail once the detailed design is available.	International requirements apply: due to a lack of a national formal basis for the census of PAPs, the process shall be planned, undertaken, monitored and documented following the requirements of PR 5 and ESS 6.

Subject	IFIs requirements	National legislation requirements	Gap	Situation in the project area	Applicable requirement
	livelihoods affected, and property to be compensated. The census date is usually also a cut-off date for eligibility claim. The census should include an inventory of losses a detailed measurement survey and valuation of lost assets, and it covers the total affected population.				
Development of LRF	<p><u>EBRD PR 5:</u> Whenever there is physical displacement (independently of the number of people), the client shall elaborate a RAP; Whenever there is economical displacement (independently of the number of people), the client shall elaborate a LRP.</p> <p><u>EIB ESS 6:</u> A RPF is required for projects where the exact project design and respective footprint and associated impacts (locations and numbers of people impacted by involuntary resettlement) have not been determined or several sub-projects are involved. Once the project design is specified and the necessary information about the project impacts is available, an RPF shall be further developed into Resettlement Action Plan(s). A RAP is required for all operations that entail involuntary resettlement unless otherwise specified.</p>	No provision in the national legislation exists.	The national legislation does not predict an instrument such as RAP, LRP or RPF.	The project will entail economical involuntary resettlement.	International requirements apply: because the project design is not yet specified, a RPF is presented in this Section. But the Project Owner (MoE) shall develop a LRF following the requirements of EBRD and EIB.
Implementation and monitoring of a LRF	<p><u>EBRD PR 5:</u> Whenever there is economical displacement the client shall elaborate a LRF that, among others</p>	No provision in the national legislation exists.	The national legislation does not predict an instrument such as LRF, and, as	The project will entail economical involuntary resettlement and, as therefore, monitoring of the	International requirements apply: the present RPF presents the

Subject	IFIs requirements	National legislation requirements	Gap	Situation in the project area	Applicable requirement
	<p>[...] provides details of arrangements for monitoring, evaluation and reporting.</p> <p><u>EIB ESS 6:</u> The promoter shall set up necessary systems (i.e. resources, staff, and procedures) to monitor the implementation of a RAP on a regular basis and take corrective action as necessary.</p>		therefore, also not the monitoring procedures	compensation procedures will be necessary.	monitoring procedures for the implementation of the LRF to be elaborated by the MoE.
Compensation	<p><u>EBRD PR 5:</u> Economically displaced persons shall be promptly compensated for loss of assets or access to assets at full replacement cost, this is to say, the market value of the assets plus transaction costs. In applying this method of valuation, depreciation of structures and assets should not be taken into account.</p> <p><u>EIB ESS 6:</u> The promoter is required to offer to the affected persons an informed choice of either compensation in kind or monetary. Monetary compensation shall take into account full replacement cost based on market value, productive potential, or equivalent residual quality.</p>	<p><u>Law No.1308-XIII</u> The state shall propose to the owner of the land another land plot into ownership in exchange for the expropriated one. Where the owner of the land refuses to take another land, or where the state has no other land to change it, then the losses shall be compensated in cash.</p> <p>The land can be purchased at market prices. It can also be expropriated at market prices, but these cannot be less than the normative price. The normative price of land is an estimating measure of its value and equals to the natural and economic potential of such land (MDL for 1 fertility grade per hectare, Law 1308 of 25.07.1997).</p>	No gaps have been encountered	Since the expropriation prices are higher than those of purchase, it is assumed that the land owners will opt for this solution.	National and international requirements apply: the land will be purchased at market price and expropriated at a price not less than the normative price.



Subject	IFIs requirements	National legislation requirements	Gap	Situation in the project area	Applicable requirement
		To know the market price it is possible to approach estate/land evaluation companies which will evaluate the land market price. To know the expropriation price, it is necessary to determine Public Consultation / Stakeholder Engagement the fertility grades (evaluation made by IPOT) and the normative price of the land, which are then multiplied by the total area of land.			
Public Consultation / Stakeholder Engagement on resettlement	<p><u>EBRD PR 5:</u> Following disclosure of all relevant information, the client will consult with affected persons and communities, and facilitate their early and informed participation in decision-making processes related to resettlement. Affected persons shall be given the opportunity to participate in the negotiation of the compensation packages, eligibility requirements, resettlement assistance, and the proposed timing. Consultation will continue during the implementation, monitoring, and evaluation of compensation payment and resettlement.</p> <p><u>EIB ESS 6:</u> It is crucial that the promoter identifies and consults with all persons and communities involved in the resettlement process. All relevant stakeholders</p>	<p>The law Nr. 86 on EIA mentions the mandatory public consultation on EIA. However, no mention exists to specific consultation with PAPs about resettlement issues.</p> <p>Although not mentioned in the national law, detailed surveys of the PAPs are undertaken in Moldova to calculate the exact compensation costs and identify the land owners.</p>	A gap between the requirements of the IFIs and the national law exists, as this one does not mention or regulate the consultation on resettlement issues.	There will be people affected by economic resettlement caused by the project.	International requirements apply: besides being thoroughly informed about resettlement, the PAPs shall be given the opportunity to participate in the decision-making processes related to it. This can be initiated during the survey of PAPs and continued until the compensation costs are paid.

Subject	IFIs requirements	National legislation requirements	Gap	Situation in the project area	Applicable requirement
	must be given the opportunity for informed participation in resettlement planning.				
Grievance mechanism on resettlement	<p><u>EBRD PR 5:</u> The grievance mechanism to be established by the client in accordance with PR 10 will be set up as early as possible in the process to receive and address in a timely fashion specific concerns about compensation and relocation that are raised by displaced persons, including a recourse mechanism designed to resolve disputes in an impartial manner.</p> <p><u>EIB ESS 6:</u> The promoter shall set up and maintain a grievance mechanism that is independent, free and in line with the requirements set out in Standard 10 and that will allow prompt addressing of specific concerns about compensation and relocation from the affected people and other directly involved entities.</p>	<p>The addressing of disputes related to compensation payments is predicted under the Moldovan Law as follows.</p> <p><u>Law No. 1308-XIII:</u> Where the public administration authority and the landowner do not reach an agreement as to the market price of the land subject to forced alienation, the price shall be established by the judicial organ, based on an expertise report concluded by independent experts (Article 17).</p> <p><u>Land Code:</u> Disputes related to recovery of losses and their amounts shall be solved in courts or by arbitration (Article 97).</p>	The national law allows the dispute of compensation measures, but a project grievance mechanism is not predicted	Disputes related to compensation matters may come up.	National and international requirements apply: a grievance mechanism as described in Section 12.8 of this ESIA shall be established for the project. The grievance mechanism must not prevent access to judicial or administrative remedies predicted in the Moldovan Law.

PAPs = Project Affected Persons | LRF = Livelihood Restoration Framework | RPF = Resettlement Policy Framework

### 12.3 Guiding principles for resettlement

The Project Owner (MoE) shall develop a formal detailed LRF document following the requirements of the IFIs as soon as the detailed design is available. The following guiding principles for resettlement shall be considered in the detailed LRF for the Ungheni-Chisinau pipeline project:

- All persons affected by the project (PAPs) will be identified and assisted in improving or regaining their standard of living.
- A census of PAPs shall be planned, undertaken, monitored and documented by a suitably qualified specialist following the requirements of EBRD's PR 5 and EIB's ESS 6. The census of PAPs will cover the total affected population and:
  - establish the number of people to be economically displaced, livelihoods affected, and property to be compensated.
  - identify the persons who will be displaced (fully or partially) by the project.
  - determine who will be eligible for compensation and assistance.
  - set a cut-off date, discouraging the inflow of people who are ineligible for these benefits.
  - make an inventory of losses, a detailed measurement survey and valuation of lost assets.
- Information related to the preparation and implementation of the detailed LRF will be disclosed to the PAPs and all key stakeholders and people's participation will be ensured in planning and implementation.
- The private land needed for the above ground structures may be purchased at market price or expropriated at a price not less than the normative price.
- In alternative to the above, and in accordance with the Law No. 1308 - XIII, replacement land may be offered to PAPs in exchange for the land needed for the above ground structures.
- Land owners without formal land titles but with a claim to the land shall be compensated before any works begin on their land. The register of the land shall be undertaken by the land owners and the process shall be supported by the MoE to assure a timely payment for the compensation.
- If informal land owners without a recognizable claim to the land are affected, they shall be compensated for lost assets other than land (in principle only crops). Resettlement assistance shall be provided if necessary.

- Before taking possession of the acquired land, compensation and resettlement assistance will be paid in accordance with the provisions described in this document.
- An appropriate grievance redress mechanism will be established to ensure speedy resolution of disputes.
- Consultations with PAPs will continue during the implementation of compensation and eventual resettlement assistance measures.

## 12.4 Compensation

In accordance with the valid legislation for construction of the state owned Ungheni-Chisinau gas pipeline:

- Public land (owned by the state or by the administrative-territorial units) can be made available for the construction of the project free of charge;
- Private land may be bought or exchanged for replacement land of the same value;
- Subject to declaring this pipeline as of public relevance, no compensation for land use alteration needs to be paid in case of state owned land;
- Land allotment for temporary use (construction period) will require compensation of damages for possible losses of crop harvests and for fall of vineyards and fruit trees (no compensation for temporary usage of pasture land). In this case, negotiations with each relevant land/vineyard/fruit tree owner with possible involvement of specialized evaluation companies will be necessary;
- No other assets (buildings and structures) are expected to be affected by construction of this gas pipeline;
- No physical resettlement with related compensations is caused by construction or operation of the pipeline.

For the determination of the compensation costs in Moldova, it is necessary to assess:

- the age and state of conservation of the plantations lost;
- the area of plantations lost;
- the land class of the area, which is a qualitative description of the soil fertility expressed in points and tariffs per point-hectar;
- the residual value of the perennial plants.

The assessment of the listed variables shall be made by specialized companies and/or IPOT, which shall visit all project affected areas. In the present ESIA/Feasibility stage, a detailed route has not yet been designed. For this reason, the detailed calculation of the compensation costs, as well as the pointing of the landowners entitled to compensation cannot be undertaken.

This Section presents an approximate estimation of the compensation costs of the route Option 1b based on the available data, the legal requirements of Moldova and reasonable assumptions.

The following costs are calculated:

- Compensation for ephemeral agricultural crops temporarily lost,
- Compensation for vineyards and orchards permanently lost,
- Land purchase (expropriation) <sup>5</sup> for above ground facilities.

No compensation is calculated for losses of forest trees (assumed to be public), as well as for temporary disturbances to exclusively pasture land (not foreseen in the legislation). It is assumed in the calculations that private land will be purchased (expropriated) and no replacement land will be available.

#### 12.4.1 Compensation for ephemeral agricultural crops temporarily lost

Should temporary land withdrawal result in abridgment of rights of the land owners, restrict the seeding of summer/winter cereals, or result in a loss of harvest, it shall be fully compensated. Ultimately it can be equal to the value of the lost harvest.

To determine the approximate compensation necessary for each ha of temporarily lost ephemeral agricultural crops (within the 16 m construction strip), the numbers calculated for the Iasi-Ungheni Interconnector project have been used (Table 12-4).

**Table 12-4: Compensation costs for ephemeral agricultural crops for the Iasi-Ungheni Interconnector project**

Length [m]	10,400.00
Construction strip width [m]	30.00
Total area [ha]	31.20
Estimated total compensation of crops [MDL]	280,000.00
Estimated compensation for the Iasi-Ungheni project ( <i>example only</i> ) [MDL/hectare]	8,974.36

The results for the Ungheni-Chisinau pipeline project can be consulted in Table 12-5.

**Table 12-5: Compensation costs for ephemeral agricultural crops for the Ungheni - Chisinau Pipeline project**

Construction strip	Total area [ha]	Compensation cost [MDL/ha]	Total cost [MDL]
Temporary losses of	116.0	8,974.36 (Iasi-Ungheni)	1,041,385

<sup>5</sup> It is assumed that expropriation will be necessary, as this raises the compensation costs

ephemeral crops		Interconnector; see Table 12-4 above)	
-----------------	--	---------------------------------------	--

#### 12.4.2 Compensation for vineyards and orchards permanently lost

If felling of trees and vineyards is required for construction of a project, their owners are entitled to compensation amounting to the plants' investment costs, added to their residual value and the the lost profit for the remaining expected service life. Table 12-6 presents the estimated compensation costs in this case.

**Table 12-6: Compensation costs for ephemeral agricultural crops for the Ungheni - Chisinau Pipeline project**

Operation/safety strip/ROW	Total area [ha]	Investment costs [MDL/ha]	Yield [ton/ha]	Lost benefit over the service life [MDL/ton]	Residual service life [years]	Total cost [MDL]
Permanent losses of orchards	46.2	200,000	20 (URL 13)	2,000 (URL 13)	10 (assumption)	27,744,000
Permanent losses of vineyards	38.4	214,920	4 (URL 12)	2,000 (URL 12)	10 (assumption)	11,319,030

#### 12.4.3 Land purchase (expropriation) for above ground facilities

For calculation of the land purchase costs it has been assumed that land expropriation will be necessary, as this raises the compensation costs. In this case, the compensation can be based on the market prices for land but cannot be less than the normative tariffs specified by Item II of the Annex to Law Nr. 1308, namely 1,248.02 MDL for one point-hectare.

The five block valve stations and two of the pigging facilities are assumed to be planned in private land with a yield class (point-hectare) of 65. The three other pigging facilities and the GPRSs are expected to be installed in state owned land, for what no costs incur from its usage for the project. The total costs for land acquisition for the above ground facilities are presented in Table 12-7.

**Table 12-7: Purchase (expropriation) costs for land to install the above ground facilities of the Ungheni - Chisinau Pipeline project**

Above ground facilities	Total area	Type of land	Yield class	Normative price [MDL/ha]	Expropriation price [MDL/ha]	Total cost [MDL]
Block valve stations (5 units)	0.05 ha	Privately owned Assumed pasture land	65 (Moldova's national average)	1,242.08 (Law 1308, art 17(1))	80,735.2 (Normative price × Yield class)	4,036.76

Above ground facilities	Total area	Type of land	Yield class	Normative price [MDL/ha]	Expropriation price [MDL/ha]	Total cost [MDL]
Pigging facilities (2 units)	0.02 ha	Privately owned Pasture land	65 (Moldova's national average)	1,242.08 (Law 1308, art 17(1))	80,735.2 (Normative price × Yield class)	1,614.70
Pigging facilities (3 units)	0.03 ha	State owned	65 (Moldova's national average)	Not entitled to compensation		
GPRSs	3.08 ha	State owned	65 (Moldova's national average)	Not entitled to compensation		
<b>Total Costs for above ground facilities [MDL]</b>				5,651.46		

#### 12.4.4 Total economical resettlement costs

Considering the results of the previous sections, a total cost of **40,110,066 MDL or 1,787,627 Euro** is calculated as a first estimation of the total economical resettlement costs of the Ungheni-Chisinau pipeline project.

### 12.5 Entitlements Matrix

A depiction of the compensation entitlements and eligibility conditions described in the previous sections is summarized in the Entitlements Matrix shown in Table 12-8.

**Table 12-8: Entitlements Matrix for the Ungheni-Chisinau Pipeline Project**

Item	Eligible persons	Entitlements
Ephemeral agricultural crops temporarily lost during construction along the pipeline route (vegetables, cereals)	Land owners with land title	Compensation of damages or losses of crop harvests
	People without land title, but with a valid claim to it (the land shall be registered before construction)	
	Informal land owners without a recognizable claim to the land *	
	Persons who encroach on the area after the cut-off date	Not entitled to compensation
Perennial agricultural crops permanently lost along the pipeline route because they are within the safety strip (orchards and vineyards)	Land owners with land title	Compensation of lost trees and vineyards
	People without land title, but with a valid claim to it (the land shall be registered before construction)	
	Informal land owners without a recognizable claim to the land *	

Item	Eligible persons	Entitlements
	Persons who encroach on the area after the cut-off date	Not entitled to compensation
Private land needed for above ground facilities	Land owners with land title	Land may be purchased at market price or expropriated at a price not less than the normative price.
	People without land title, but with a valid claim to it (the land shall be registered before construction)	
	Informal land owners without a recognizable claim to the land *	Compensation for lost assets other than land (in principle only crops)
	Persons who encroach on the area after the cut-off date	Not entitled to compensation

\* The entitlement of informal land owners without a valid claim to the land to compensation for losses or damages to crops is a IFIs' requirement (see gap analysis on Table 12-3 of this ESIA)

## 12.6 Resettlement planning

Based on the requirements of the EIB and the EBRD, the international financing institutions sponsoring the project, during detailed design the Project Owner (MoE) shall undertake a **detailed census of PAPs** to: (i) identify persons who will be displaced by the project; (ii) determine who will be eligible for compensation and assistance; and (iii) take inventory of affected land and property.

The census shall include an inventory of losses (assets, access to resources or services, etc.), a detailed measurement survey and valuation of lost assets, and it covers the total affected population.

In the absence of specific national government procedures, the census date is usually also a **cut-off date** for eligibility claims. Cut-off dates determine the eligibility for compensation of project-affected persons. Therefore, they represent the actual date that the project-affected persons' assets and infrastructure at a particular site were recorded during the census survey. Assets like land, structures and others, which are created, encroached or acquired by individuals or groups after the cut-off dates, will not be eligible for compensation.

The cut-off date may also be the date of the project area delineation, prior to the census, but only following an effective and documented public information dissemination on the area delineated, and systematic and continuous dissemination subsequent to the delineation.



Based on the information from the census, the promoter will be able to specifically determine the **costs** of the economical resettlement of the project, as well as to determine which amount of money will be received by each PAP.

Based on the information collected during the census and the specific determination of the costs, a specific and detailed **Livelihood Restoration Framework (LRF)** following the EIB and EBRD's guidelines shall be prepared for the project.

The detailed LRF shall be agreed with the IFIs.

The following step of the process shall be that of the payment of fair, consistent and timely **compensation** for the land and agricultural assets to be affected temporarily and permanently by the project. The payment of the compensation shall be made before any impacts are delivered, i.e., before the construction works begin.

Finally, the MoE shall set up resources, staff and procedures necessary to **monitor the implementation** of the LRF on a regular basis and take corrective actions as necessary. The implementation and effectiveness of the LRF shall be subject to monitoring and review by qualified resettlement specialists and/or other independent third parties as appropriate.

All relevant stakeholders shall be given the opportunity to be informed and participate in the elaboration of the detailed LRF for the project. The **public engagement** process has been initiated in the scoping stage (Section 2.2 of this ESIA) and will continue during the disclosure of the present Draft Final Preliminary ESIA Report. The detailed census of PAPs shall be used as an additional opportunity to directly consult with the PAPs.

The PAPs will, through this process, be given the opportunity to participate in the negotiation of compensation packages and eligibility requirements, as well as any applicable resettlement assistance and the timing of the process. Consultation on the LRF shall continue during the implementation, monitoring, and evaluation of compensation payments. Details of the public engagement actions planned and undertaken for the project can be consulted in the Draft Final Public Disclosure and Consultation Plan available in Annex 16.5 of this ESIA.

## 12.7 Monitoring

The implementation of the detailed LRF shall be monitored regularly to help ensure that it is implemented as planned and that compensation measures are adequate and effective. Internal monitoring shall be conducted by the MoE covering the following:

- Compliance with land acquisition and compensation policies;

- Adequacy of the organizational mechanism for implementing the detailed LRF;
- Fair and judicious handling of complaints and grievances;
- Compensation payments to PAPs made as mandated by the detailed LRF; and
- Success in restoring the PAPs incomes to pre-project levels.

As the MoE/MEPIU does not have the capacity to monitor all activities of the LRF as above listed, it is assumed that a third party will be involved on its behalf, i.e., a **LRF Consultant**.

### 12.7.1 LRF Consultant

Internal monitoring shall be carried out by the LRF Consultant on a monthly basis and will be reported to the MoE on a quarterly basis until the end of the compensation process. The LRF Consultant will be responsible for determining if any follow-up actions are necessary and ensuring these actions are undertaken.

Prior to the delivery of compensation payments to the PAPs, the MoE will announce the compensation dates, including a detailed compensation schedule community by community. The LRF Consultant will monitor to ensure that no construction in the affected areas will commence until the payment of compensation has been fully completed and that concerns from PAPs are identified timely and addressed effectively.

## 12.8 Grievance mechanism

According to the standards of the financing agencies EIB and EBRD, a grievance mechanism for the Ungheni-Chisinau pipeline project shall be set up and maintained that will allow prompt addressing of specific concerns about land acquisition, economic displacement, and compensation issues. This grievance mechanism shall be integrated into the one created to address ESIA complains and issues described in the PCDP (Annex 16.6 of this ESIA).

The grievance mechanism shall be established as early as possible in the process and should enable the promoter (MoE) to receive and resolve specific grievances related to land acquisition, economic displacement, and compensation by affected persons. The grievance mechanism shall be independent, free, easily accessible, culturally appropriate, and widely publicized.

The grievance mechanism must not prevent access to judicial or administrative remedies predicted in the Moldovan Law. The adressing of disputes related to compensation payments is predicted under the Moldovan Law as follows:

- Where the public administration authority and the landowner do not reach an agreement as to the market price of the land subject to forced alienation, the price shall be established by the judicial organ, based on an expertise report concluded by independent experts (Article 17 of the Law No. 1308-XIII).
- Losses caused by temporary use of the land plots, abridgment of rights, or deterioration of land quality (including lost benefits) by other enterprises shall be compensated to land owners who suffered such losses. Disputes related to recovery of losses and their amounts shall be solved in courts or by arbitration (Article 97 of the Land Code).

Handling of grievances should be done in a culturally appropriate manner and be discrete, objective, sensitive and responsive to the stakeholders' needs and concerns. The mechanism should also allow for anonymous complaints to be raised and addressed.

The MoE shall inform the affected communities about the grievance process in the course of its ESIA-related community engagement activities (please refer to Section 11 of this ESIA), and report regularly to the public on its implementation, protecting the privacy of affected individuals.

The procedures for allowing the register of grievances related to the economical resettlement issues for the Ungheni-Chisinau gas pipeline project are suggested as follows:

- Nomination of a Community Liaison Officer (CLO) by the MEPIU: a direct contact person (CLO) for receiving and answering to grievances shall be nominated by the MEPIU and the stakeholders shall be informed thereof.
- The MEPIU's and the MoE's webpage: there shall be a visible link for register of resettlement related grievances for the PAPs.
- Suggestion boxes: These shall be placed in public locations such as libraries, the developer's offices, local government buildings and also in the venues where the public consultation meetings take place.

A record or grievance log shall be kept of all complaints, as well as of the answer given to those. The record should contain:

- the name of the individual or organization (if the grievance has not been made anonymously);
- the date and nature of the complaint;
- any follow-up actions taken;
- the final result; and
- how and when this decision was communicated to the complainant.

## 12.9 Responsibilities for LRF

The development, implementation, and internal monitoring of the detailed LRF is the responsibility of the project's developer or initiator, the **Ministry of Economy**. This implies as well the organization of the public engagement activities.

As the MoE/MEPIU does not have the capacity to implement all activities in accordance with the LRF requirements, it is assumed that third parties will be involved on its behalf, i.e.:

- a **LRF Consultant** that will develop and support the implementation of the detailed LRF;
- a **second LRF Consultant** that will internally monitor the compensation process as described under Section 12.7.1 above.

The land acquisition/expropriation process shall be the responsibility of an **entity to be nominated** by the Government of Moldova. The MoE/MEPIU shall work together and coordinate the process with this entity.

## 13. Environmental and Social Action Plan

In order to fulfill the demands of this ESIA, and in particular of the ESMP, certain actions are required from the different parties of the project. These actions have been described along the report, but are listed and briefly described in the following **Environmental and Social Action Plan (ESAP)** (Table 13-1). References to previous sections of this ESIA are made, where the background for these actions and guidelines for their development can be consulted.

The Construction Contractor and the Operation Contractor shall establish their own Health, Safety and Environment Plans (HSE Plans) based on the ESMP developed in the present ESIA (Section 10). The ESMP implies consideration not only of the national legislation, but also of the requirements of the IFIs.

The **HSE Plan for construction** and the **HSE Plan for operation** shall describe how environmental and social matters will be managed at site, and how the ESIA's requirements will be applied in practice. It will detail how the Contractors will mitigate construction and operation impacts and will document the Contractors' response to inspecting, monitoring, verifying, internal auditing and correcting or improving environmental/social/H&S performance.

The Contractors shall ensure adequate communication of these requirements throughout the supply chain, its supervision, and to the workers themselves.

Any changes to the commitments of this ESIA, the ESMP and the present ESAP motivated by changes in the project's planning and design shall not be undertaken without the previous approval of the Project Owner and the Lenders.

The HSE Plan for construction shall include additional specific **HSE sub-plans** as identified in this ESIA, namely:

- Soil Management and Erosion Control Plan (Section 8.1.1.1 of this ESIA): Soil Management and Erosion Control Plan: It shall include measures for avoidance of landslides and severely eroded areas, measures for the cases where this avoidance is not possible, top soil management measures (stripping, preservation), measures to avoid rutting and compaction, and reinstatement measures.
- Waste Management Plan (Section 8.1.1.2 of this ESIA): It shall consider basic principles such as waste management hierarchy, segregation, minimization, awareness increase, inspecting and auditing. It shall contain provisions for handling sewage, hazardous waste, excess subsoil (spoil), and recyclable waste.
- Water Crossings Management Plan (Section 8.1.1.3 of this ESIA): It will define the water crossings' timing and technique according to the water

features' characteristics, based on the results of the Hydrological Survey and the Aquatic Life Survey. The basic objectives will be the avoidance of impacts on aquatic fauna and flora, as well as on any sensitive habitats, and restoration of banks after crossing.

- Spill Prevention and Cleanup Plan (Section 8.1.1.3 of this ESIA): It will prevent and remediate water contamination caused by the incorrect disposal or accidental run-off of sewage, fuel, new and used engine oil and lubricants, waste water resulting from washing of vehicles and machinery, and sediments resulting from earth works.
- Traffic Management Plan (Section 8.1.3.2 of this ESIA): It will prevent impacts on the mobility and traffic safety of the surrounding communities. It will include as basic measures providing temporary access alternatives, providing community information, and liaising with authorities.
- Worker's Grievance Mechanism (Section 8.1.3.4 of this ESIA): It shall constitute an independent grievance management system to enable the workers (and their organizations, where they exist) to raise reasonable workplace concerns. This includes complaints related to non-compliance with health & safety matters, discrimination cases and non-consideration of equal opportunities.
- Workers' Code of Conduct (Section 8.1.3.5 of this ESIA): In order to avoid conflicts or other problems with the local populations during construction, the Workers' Code of Conduct shall contain provisions such as "good neighborhood" principle, prohibition of resource to direct conflict, respect for the local religious, cultural, and social activities.
- Chance Find Procedure (Section 8.1.3.7 of this ESIA): It will contain provisions for ceasing work as soon as historical and cultural sites, buildings, or objects are encountered during construction. It will include providing relevant information to the Ministry of Culture about the chance find.

The HSE Plan for operation shall include an additional specific **HSE sub-plan** as identified in this ESIA, namely:

- Emergency Prevention, Preparedness and Response Plan (Section 8.2.3.3 of this ESIA): Plan to include measures involving appropriate public authorities to handle emergency situations which may entail damages to structures (roads, railways) and risks for human life. Establishment of a telephone notification system, and of a pipe location service shall be part of the Plan.

The guidelines and principles for elaboration of the HSE sub-plans are described in Table 10-1 of the ESMP.

In addition to the HSE sub-plans, the Construction Contractor shall undertake or request the following surveys before the works begin (**pre-construction surveys**):

- *Landslides and Erosion Survey* (Section 8.1.1.1 of this ESIA): Despite the existing data on erosion prone areas and landslides, a Landslides and Erosion Survey in the project area shall be undertaken by the contractor during the detailed design phase and at least three months prior to any heavy machinery working in the RoW or in clearing activities. It will be of interest also to avoid crossing of potential dangerous areas where trenching may trigger a new landslide. This survey shall be undertaken in direct contact with the farmers and land owners, which may help pointing site-specific soil characteristics and flag any sensitive areas which may exist within the construction strip or within the areas defined for location of temporary or permanent structures. The pipeline route shall be deviated from and structures shall not be placed on landslides and severely eroded areas to the extent possible.
- *Hydrological survey* (Section 8.1.1.3 of this ESIA): Considering the relatively large number of water crossings, it is necessary to obtain more detailed information about the surface water features in the area. A Hydrological Survey of the affected area shall be undertaken by the construction contractor during the detailed design phase and covering Winter and Summer periods that will allow: making a detailed inventory of all pipeline crossings; determining the width and depth of the rivers and other water features to be crossed; identifying those features prone to erosion and water channel changes; determining any perennial water features and the period of the year when these may be dry or have lower water levels; flagging the boundaries of wetlands.
- *Utilities Survey* (Section 8.1.3.3 of this ESIA): Prior to construction works a detailed Utilities Survey shall be done by the Construction Contractor to identify the utilities along the pipeline route located under and above ground such as water supply, sewerage, cable network, telephone and power supply can be damaged during construction.

Other pre-construction surveys shall be undertaken by the Project Owner (MoE):

- *Detailed survey of PAPs* (Sections 8.1.3.1 and 12.6 of this ESIA): the MoE (Project Owner) shall conduct specific site surveys to collect information on the exact affected areas, respective owners (or project affected people, PAP), and determine the compensation mechanisms and costs. This survey of PAPs shall be part of a detailed resettlement instrument and can only be undertaken once the detailed design is available.
- *Aquatic Life Survey* (Section 8.1.2.3 of this ESIA): the Project Owner (MoE) shall undertake a Aquatic Life Survey to obtain more detailed information about the aquatic species that live in or in the surroundings

of the surface water features in the area. The main objectives of the Aquatic Life Survey will be to determine the presence of any protected species of fish, birds, mammals, amphibians, reptiles, or insects within the water courses to be crossed; to determine fish spawning, feeding, over-wintering or nursery areas; and to determine the sensitivities of the water courses to be crossed, and support thereof the development of the Water Crossings Management Plan with temporal and spatial avoidance measures, as well as mitigation measures for each crossing location. The scope of the Aquatic Life Survey shall be determined by a biologist specialized in fresh water animals, preferably with previous knowledge about the project area. The scope shall clarify which water courses shall be included, and during which time of the year the survey shall be undertaken. The biologist shall use this ESIA as a basis for the planning of her/his work.

- *Birds survey* (Section 8.1.2.1 of this ESIA): Protected species of eagles and falcons, and a protected species of owl live and nest within the Plaiuul Fagului reserve. There is, as therefore, a possibility that some individuals also live and nest in the protection buffer of the reserve. To assess the presence of these species, a Birds Survey shall be undertaken in the protection buffer area crossed by the pipeline. This can be done by verifying the presence of nests which could be used by the protected species. The scope of the Bird Survey shall be determined by a biologist specialized in avifauna, preferably with previous knowledge about the project area. This inspection shall be preferably undertaken in Spring and early Summer, but the scope shall further clarify during which time of the year the survey shall be undertaken. The biologist shall use this ESIA as a basis for the planning of her/his work.
- *Trees survey* (Section 8.1.2.1 of this ESIA): Within the protection buffer of the Plaiuul Fagului reserve some trees may have to be cleared. It is not clear at the present if these trees could constitute a shelter for protected species of beetles or carpenter bees. For this reason, a Trees Survey shall be undertaken covering the protective buffer of the Plaiuul Fagului reserve crossed by the pipeline. The Trees Survey shall visually evaluate the age of the trees; and detect the presence of nests of carpenter bees. The Trees Survey shall be undertaken by a specialized biologist, preferably with previous knowledge about the project area. The biologist shall use this ESIA as a basis for the planning of her/his work.
- *Archaeological Survey* (Section 8.1.3.7 of this ESIA): Impacts on known cultural, historical and archaeological buildings are not expected. However, unknown sites might be present along the project area. For this reason, an Archaeological Survey conducted by a team of archaeologists holding valid archaeological research licenses shall be conducted before the works begin. The construction works cannot be initiated without the obtainance of all relevant permits from the Ministry of Culture, which will be based on the results of this survey.



The reasonig and scope of these pre-construction surveys can be further consulted in the different ESIA sections as above listed. The ESIA did not identify the need to undertake any surveys before operation.

Also responsibility of the Project Owner is the preparation and implementation of a Livelihood Restoration Framework as detailed in this ESIA under Section 12.

Table 13-1 below summarizes the information from the previous paragraphs into an ESAP.

**Table 13-1: Environmental and Social Action Plan for the Ungheni-Chisinau Gas Pipeline Project**

Action		Responsibility for preparation/implementation	Review and approval	Timing	Scope/details
Implementation of the PCDP, incl. general public grievance mechanism	The PCDP describes the strategy and program to be implemented for engaging with the stakeholders of the project in a culturally and timely appropriate manner. The stakeholder engagement activities shall continue to be implemented. The general public grievance mechanism shall be implemented.	MoE/MEPIU Construction Contractor Operator	--	During the ESIA stage During construction During operation	ESIA, Section 11 and Annex 16.6
Elaboration of pre-construction surveys	Landslides and Erosion Survey	Construction Contractor (the support of the farmers and land owners shall be requested)	IFIs MEPIU/MoE	During the detailed design phase and at least three months prior to any heavy machinery working in the RoW or in clearing activities	ESIA, Section 8.1.1.1
	Hydrological Survey	Construction Contractor	IFIs MEPIU/MoE	During the detailed design phase and covering Winter and Summer periods	ESIA, Section 8.1.1.3
	Utilities Survey	Construction Contractor	IFIs MEPIU/MoE	During the detailed design phase	ESIA, Section 8.1.3.3
	Detailed survey of PAPs	MoE/MEPIU by contracting social expert(s)	IFIs MEPIU/MoE	During the detailed design phase	ESIA, Sections 8.1.3.1 and 12.6
	Aquatic Life Survey	MoE/MEPIU by contracting biologist(s)	IFIs MEPIU/MoE	Before detailed design is completed, in Spring/Summer time (between March and September) (timing to be confirmed by specialist)	ESIA, Section 8.1.2.3
	Birds Survey	MoE/MEPIU by contracting biologist(s)	IFIs MEPIU/MoE	Before detailed design is completed, in Spring/Summer time (between March and September) (timing to be confirmed by specialist)	ESIA, Section 8.1.2.1

Action		Responsibility for preparation/implementation	Review and approval	Timing	Scope/details
	Trees Survey	MoE/MEPIU by contracting biologist(s)	IFIs  MEPIU/MoE	Before detailed design is completed, in Spring/Summer time (between March and September) (timing to be confirmed by specialist)	ESIA, Section 8.1.2.1
	Archaeological Survey	MoE/MEPIU by contracting licensed archaeologist(s)	IFIs  MEPIU/MoE  Ministry of Culture (National Archaeology Agency)	Three months before construction works begin	ESIA, Section 8.1.3.7
Undertake the detailed design of the Project	The definition of the exact pipeline route, the location of access roads, workers camps, and other temporary structures, as well as location of the above ground components shall be made in detail and considering the aspects discussed in this ESIA.	MoE/MEPIU <i>or</i> Design Contractor <i>or</i> EPC Contractor	IFIs  MEPIU/MoE  Ministry of Environment	After sucessful tendering process	ESIA, Sections 7 and 8
Preparation of detailed LRF	The detailed LRF for the project shall include: <ul style="list-style-type: none"><li>• detailed census of PAPs,</li><li>• establishment of a cut-off date,</li><li>• undertake the delivery of fair, consistent and timely compensation,</li><li>• monitor the implementation of the LRF and take corrective actions as necessary, and</li><li>• engage the PAPs throughout the whole process.</li></ul>	MoE/MEPIU by hiring a LRF Consultant	IFIs  MEPIU/MoE  MoEn	Immediately after obtainment of environmental permit; the compensation shall be delivered and any disputes shall be solved before the construction works are initiated.	ESIA, Section 12
Preparation of an HSE Plan for construction		Construction Contractor	IFIs  MEPIU/MoE	One month before construction works begin	ESIA, Section 8.1
Preparation of HSE sub-plans for	Soil Management and Erosion Control Plan	Construction Contractor	IFIs	One month before construction works begin	ESIA, Section 8.1.1.1

Action		Responsibility for preparation/implementation	Review and approval	Timing	Scope/details
construction			MEPIU/MoE		
	Waste Management Plan	Construction Contractor	IFIs MEPIU/MoE	One month before construction works begin	ESIA, Section 8.1.1.2
	Water Crossings Management Plan	Construction Contractor	IFIs MEPIU/MoE	One month before construction works begin	ESIA, Section 8.1.1.3
	Spill Prevention and Cleanup Plan	Construction Contractor	IFIs MEPIU/MoE	One month before construction works begin	ESIA, Section 8.1.1.3
	Traffic Management Plan	Construction Contractor	IFIs MEPIU/MoE	One month before construction works begin	ESIA, Section 8.1.3.2
	Worker's Grievance Mechanism	Construction Contractor	IFIs MEPIU/MoE	One month before construction works begin	ESIA, Section 8.1.3.4
	Workers' Code of Conduct	Construction Contractor	IFIs MEPIU/MoE	One month before construction works begin	ESIA, Section 8.1.3.5
	Chance Find Procedure	Construction Contractor	IFIs MEPIU/MoE	One month before construction works begin	ESIA, Section 8.1.3.7
Implementation of the ESMP for construction	The mitigation, avoidance, compensation and monitoring measures predicted in the ESMP shall be applied by all parties involved as identified in the ESMP.	All parties	--	During construction	ESIA, Section 10
Preparation of an HSE Plan for operation		Operator	IFIs MEPIU/MoE	Six months before operation begins	ESIA, Section 8.2
Preparation of HSE sub-plans for operation	Emergency Prevention, Preparedness and Response Plan	Operator	IFIs MEPIU/MoE Centre for Public Health	Six months before operation begins	ESIA, Section 8.2.3.3
Implementation of the ESMP for	The mitigation, avoidance, compensation and monitoring measures predicted in the	All parties	--	During operation	ESIA, Section 10

Action		Responsibility for preparation/implementation	Review and approval	Timing	Scope/details
operation	ESMP shall be applied by all parties involved as identified in the ESMP.				

## 14. Conclusion

The ESIA demonstrated that some negative impacts may be expected from the construction and operation of the Ungheni-Chisinau pipeline on the physical, biological and human environment of the project area. However, the establishment and application of HSE Plans for both phases has the potential to avoid or reduce these negative impacts to a minimum, making it possible to construct and operate the project while keeping the environmental and socio-economic sustainability of the area. These HSE plans must be internally and externally accompanied and continuously adapted to the specific and eventually changing conditions on site.

The tendering documents for the Ungheni-Chisinau pipeline project must include the obligation to respect the provisions of this ESIA, the ESMP and the ESAP. In case the provisions of this ESIA, the ESMP and the ESAP are respected, the project may be built and operated under respect of the Moldovan legislation and the policies of the financers EBRD and EIB on environmental and social matters.

As a final note, it is important to consider that the strict Moldovan technical and security rules have been followed in the feasibility study of the pipeline, as well as in this ESIA. However, to deviate from these rules would limit the negative impacts of the pipeline. One of the rules relates to the proximity to gas stations. As discussed in Section 6.4 of this ESIA, a shorter route has been abandoned because it passes ca. 82 meters from a petrol station, which is considered a quite strict rule when compared to European practice. In addition, a security strip/ROW of 50 meters is normally not considered under European rules. Such a large ROW implies a large impact on private trees and bushes (vineyards and orchards - economical impacts), as well as in public forest (biological impacts). A deviation from the Moldovan technical rules for construction of pipelines would be favourable in terms of environmental and social impacts, and international safety standards would still be respected.

## 15. References

- Bennett, G. and Mulongoy, K.J., 2006:** *Review of Experience with Ecological Networks, Corridors and Buffer Zones*, Graham Bennett and Kalemani Jo Mulongoy, Secretariat of the Convention on Biological Diversity, Montreal, Technical Series No. 23, March 2006
- BNS, 2014:** *Resursele Naturele și mediul în Republica Moldova*, Biroul National de Statistica al Republicii Moldova, Culegere statistică, Chisinau, 2014
- Boot, R.D., 2007:** *Flaring: Questions + Answers, Second Edition*, Robert D. Bott, Canadian Centre for Energy Information, 2007
- DEGT, 2006:** *Environmental Manual for construction projects in Canada*, Duke Energy Gas Transmission, June 2006
- Doody et al, 2003:** *Fauna by-catch in pipeline trenches: conservation, animal ethics and current practices in Australia*, The Australian Zoologist, Volume 32 (3), October 2003
- EBRD, 2008:** *Environmental and Social Policy*, European Bank for Reconstruction and Development, May 2008
- EBRD, 2010:** *Strategy for Moldova 2010 - 2013*, 2010
- EC, 2001:** *Guidance on EIA Scoping*, European Commission, June 2001
- EIB, 2013:** *Environmental and Social Handbook*, European Investment Bank, December 2013
- Fichtner, 2014:** *Pre-feasibility Report for the Ungheni-Chisinau Natural Gas Pipeline, Final Report*, Fichtner, December 2014
- Fichtner, 2015:** *Inception Scoping Report, Feasibility Study of the Ungheni-Chisinau Natural Gas Pipeline*, Final Report, Stuttgart, January 2015
- Fichtner and IPOT, 2014:** *Pipeline Routing Analysis, Feasibility Study of the Ungheni-Chisinau Natural Gas Pipeline*, Stuttgart, November 2014
- Government of Moldova, 2011:** *Proiectul Hotărîrii Guvernului cu privire la aprobarea Strategii Naționale de Consolidare a Terenurilor pentru anii 2012-2027 (Draft decision on the Agricultural Land Consolidation Strategy for 2012-2027)*, 2011
- GWP Moldova, year unknown:** *Moldova: Analysis of transboundary management of the Dniester river basin (#425)* GWP Moldova, GWP Moldova

**Holman et al, 2014:** *IAQM Guidance on the assessment of dust from demolition and construction*, Institute of Air Quality Management, London, January 2014

**IFC, 2007:** *IFC General Environmental, Health & Safety Guidelines*, IFC, April 30, 2007

**IFC, 2007b:** *IFC Environmental, Health & Safety Guidelines for onshore Oil and Gas development*, IFC, April 30, 2007

**IFC, 2007c:** *IFC Environmental, Health & Safety Guidelines for gas distribution systems*, IFC, April 30, 2007

**IFC/EBRD, 2009:** *Workers' accommodation: processes and standards, A guidance note by IFC and the EBRD*, IFC and EBRD, August 2009

**IROWA, 1985:** Pipeline construction: prevention of impacts on agricultural lands, International Right of Way Association, Magazine "Right of Way", August 1985.

**Jodi A. Hilty et al., 2006:** Corridor Ecology: The Science and Practice of Linking Landscapes for Biodiversity Conservation, Jodi A. Hilty, William Z. Lidicker Jr., Adina M. Merelender, Island Press, Washington, DC, 2006

**Mathews, J., 2006:** Rainwater and Land Development: Ohio's Standards for Stormwater Management, Land Development and Urban Stream Protection, Ohio Department of Natural Resources, Division of Soil and Water Conservation, December 2006

**Mediul Ambient, 2008:** Mediul Ambient no. 3(39) of June 2008, Scientific Journal of Information and Ecological Culture, Ministry of Ecology and Natural Resources, Institute of Ecology and Geography of ASM, 2008

**Mediul Ambient, 2011:** Mediul Ambient no. 6(60) of December 2011, Scientific Journal of Information and Ecological Culture, Ministry of Ecology and Natural Resources, Institute of Ecology and Geography of ASM, 2011

**MoEn, year unknown:** Environmental Protection in the Republic of Moldova, Ministry of the Environment and Natural Resources, Moldova

**MoEn, 2005:** Republic of Moldova, State of the Environment 2004, Ministry of Environment and Natural Resources of the Republic of Moldova, Chisinau, 2005

**MoEn, 2005b:** Republic of Moldova - Environmental Management - Report on national capacity self-assessment, Chisinau, 2005

**MoEn, 2009:** Second National Communication of the Republic of Moldova under the United Nations Framework Convention on Climate Change,



Ministry of Environment and Natural Resources of the Republic of Moldova, Chisinau, 2009

**MoEn, 2011:** State of the Environment in the Republic of Moldova 2007-2010 (National Report-Synthesis), Ministry of the Environment of the Republic of Moldova, Institute of Ecology and Geography, Chisinau, 2011

**MoEn, 2012:** National Climate Change Adaption Strategy of the Republic of Moldova - Revised Final Version, Chisinau, 2012

**MoEn, 2014:** Anuar, Starea calitatii apelor de suprafata conform indicilor hidrochimici pe teritoriul Republicii Moldova in anul 2013, Serviciul Hidrometeorologic de Stat, Ministeriul Mediului al Republic Moldova, Chisinau, 2014

**MoEn, 2014b:** Planul de Gestionare a Districtului Bazinului Hidrografic Nistru, 23.09.2014 (draft for public hearings)

**MoEn and MoH, 2010:** Children's health and environment in the republic of Moldova, Ministry of Health and Ministry of Environment of the Republic of Moldova, Chisinau, 2010

**NMDGF, 2007:** *Oil and Gas Development Guidelines, Conserving New Mexico's Wildlife Habitats and Wildlife*, New Mexico Department of Game and Fish, New Mexico, USA, August 2007

**Pienaru, A., et al, 2014:** Program Regional Sectorial de Alimentare cu Apă și de Canalizare pentru Regiunea de Dezvoltare Centru, Adriana Pienaru, Mihail Cojocaru, Leonid Meleca, Anatol Burciu, Cristian Murariu, Jene Jalalite, Andreas de Jong, May 2014

**Reid & Anderson, 1999:** Scott M. Reid & Paul G. Anderson (1999), *Effects of sediment released during open-cut pipeline water crossings*, Canadian Water Resources Journal / Revue canadienne des ressources hydriques, 24:3, 235-251, DOI: 10.4296/cwrj2403235

**Știința, 2002:** Strategia Națională și Planul de Acțiuni în domeniul conservării diversității biologice, Chisinau, 2002

**The World Bank, 2007:** Integrating Environment into Agriculture and Forestry  
Progress and Prospects in Eastern Europe and Central Asia, Volume II, Moldova, Country Review, The World Bank, November 2007

**The World Bank, 2010:** The Republic of Moldova - Climate Change and Agriculture - Country Note, The World Bank, 2010

**Teleuță, A., 2010:** Republic of Moldova, The Fourth National Report on Biological Diversity, United Nations Development Programme, Ministry of Environment, Chisinau, 2010

**Teleuță, A., 2013:** Republic of Moldova, The fifth National Report on Biological Diversity, United Nations Development Programme, Ministry of Environment, Chisinau, 2013

**UN, 2005:** Report on major policy issues emerging from the current performance reviews, Committee on Environmental Policy, Economic and Social Council of the United Nations, CEP 2005/07, 26 July 2005

**UNDP, 2009:** Climate change in Moldova. Socio-economic impact and policy options for adaptation, National Human Development Report 2009/2010, UNDP, 2009

**UNECE, 2014:** Environmental Performance Reviews, Republic of Moldova, Third Review Synopsis, United Nations Economic Commission for Europe, 2014

**USEPA, 1971:** Noise from Construction Equipment and Operations, Building Equipment and Home Appliances, United States Environmental Protection Agency, 1971

**Vatamaniuc, M., 2012:** European Neighborhood and Partnership Instrument, Shared Environmental Information System, Republic of Moldova National Report, Marcela Vatamaniuc, Chisinau, January 2012

**URL 1:** PBR Technology:  
[http://www.pbrtechnology.com/projects\\_carried\\_out.asp](http://www.pbrtechnology.com/projects_carried_out.asp)

**URL 2:** National Energy Board, Government of Canada: <https://www.nel-one.gc.ca/pplctnflng/mjrpp/mcknzgs/rfd/rfdv1p3-eng.html>

**URL 3:** European Environment Agency, Biogeographical regions:  
<http://www.eea.europa.eu/data-and-maps/data/biogeographical-regions-europe-1>

**URL 4:** Monitoring Centre on Environmental Quality of Moldova.  
<http://www.meteo.md/en/monitoring.htm>

**URL 5:** National Geospatial Data fund of Moldova:  
<http://www.geoportal.md/>

**URL 6:** Centre for Climate Adaptation:  
<http://www.climateadaptation.eu/moldova/fresh-water-resources/>

**URL 7:** International Union for Conservation of Nature:  
<http://www.iucn.org/>

**URL 8:** World Database on Protected Areas:  
<http://www.protectedplanet.net/>

**URL 9:** International Union for Conservation of Nature - Ecological Network of Moldova:  
<http://www.iucn.org/about/union/secretariat/offices/europe/about/places/belgrade/?10743/A-step-towards-Ecological-Network-of-Moldova>

**URL 10:** BIOTICA Moldova: <http://www.biotica-moldova.org/>

**URL 11:** Wisconsin Wetlands Association: <http://wisconsinwetlands.org/>

**URL 12:** Vineyards varieties in Moldova.  
[http://vinograd.info/info/raznoe/sozdanie-vinogradnyh-nasazhdenii-stolovyh-sortov-v-moldove\\_2.html](http://vinograd.info/info/raznoe/sozdanie-vinogradnyh-nasazhdenii-stolovyh-sortov-v-moldove_2.html)

**URL 13:** BusinessClass - Agribusiness: how to extract excess profits?  
[http://www.businessclass.md/%D1%82%D0%B5%D0%BC%D0%B0/Agro\\_biznez\\_kak\\_izvle4i\\_sverhpribili/?lg=ru](http://www.businessclass.md/%D1%82%D0%B5%D0%BC%D0%B0/Agro_biznez_kak_izvle4i_sverhpribili/?lg=ru)

## **16. Annexes**

### **16.1 Protected species in the project area**

#### **16.1.1 Natural forest reserve Seliște-Leu**

**Table 16-1: Protected mammal species living in the reserve Seliște-Leu**

Ordo	Familia	Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	CITES	Bern Convention	Bonn Convention	IUCN Red List 2013
Carnivora	Canidae	Vulpes	vulpes Linnaeus, 1758	Red Fox	VIII		+			
Carnivora	Mustelidae	Mustela	nivalis Linnaeus 1766	Least Weasel	VIII		+			
Carnivora	Mustelidae	Martes	foina Erxleben, 1777	Beech Marten	VIII		+			
Carnivora	Mustelidae	Felis	silvestris Schreber, 1777	Wild Cat	III	+	+			

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments

**Table 16-2: Protected bird species living in the reserve Seliște-Leu**

Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	CITES	Bern Convention	Bonn Convention	IUCN Red List 2013
Accipiter	nissus	Eurasian Sparrowhawk	V		+			
Asio	Otus	Northern Long-eared Owl	VII		+			
Buteo	Buteo	Eurasian Buzzard	VIII		+			
Buteo	Lagopus	Rough-legged Buzzard	VIII		+			
Crex	Crex	Corncrake	VII			+	+	
Dendrocopos	Leucotos	White-backed Woodpecker				+		
Dendrocopos	Siriactus	Syrian Woodpecker				+		
Emberiza	Hortulana	Ortolan Bunting				+		
Falco	Columbarius	Merlin	V		+	+		
Falco	Peregrinu.	Peregrin Falcon	V		+	+		

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments

**Table 16-3: Protected reptile and amphibian species living in the reserve Seliște-Leu**

<b>Familia</b>	<b>Genus</b>	<b>Species</b>	<b>Common Name</b>	<b>Law on Protected Areas *</b>	<b>Moldova Red Data Book 2001</b>	<b>CITES</b>	<b>Bern Convention</b>	<b>IUCN Red List 2013</b>
Lacertidae	Lacerta	viridis Laur.	European Green Lizard				+	
Colubridae	Coronella	austriaca Laur.	Smooth Snake	IV	EN		+	
Viperidae	Vipera	berus L.	Northern Viper	IV	EN			
Discoglossidae	Bombina	bombina L.	European fire-bellied toad				+	
Hylidae	Hyla	arborea L.	European tree frog				+	

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments

**Table 16-4: Protected insect species living in the reserve Seliște-Leu**

Genus	Species	Common Name	Law on Protected Areas*	Moldova Red Data Book 2001	CITES	Bern Convention	Bonn Convention	IUCN Red List 2013
Oryctes	Nasicornis	European rhinoceros beetle	III	+				
Lucanus	Cervus	Stag beetle	III	+		III		
Saturnia	Pyri	Giant peacock moth	III	+				
Iphiclides	Podalirius	Scarce Swallowtail	III	+				

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments

**Table 16-5: Protected plant species living in the reserve Seliște-Leu**

Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	CITES	Bern Convention	Bonn Convention	IUCN Red List 2013
Staphylea	<i>pinnata L.</i>	European bladdernut	II					
Fritillaria	<i>meleagris L.</i>	snake's head	IV	+				
Tulipa	<i>biebersteiniana</i>	Bieberstein tulip flowers	IV					
Vinca	<i>minor</i>	lesser periwinkle	II					

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments

### 16.1.2 Scientific Reserve Plaiul Fagului



**Table 16-6: Protected mammal species living in the reserve Plaiul Fagului**

Familia	Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat Directive A-IV	IUCN Red List 2013
Erinaceidae	Erinaceus	europaeus (Linnaeus, 1758)	European Hedgehog	VIII		+	+			
Soricidae	Sorex	araneus Linnaeus, 1758	Euroasian shrew	VIII			+			
Soricidae	Sorex	minutus Linnaeus, 1766	Euroasian Pygmy Shrew	IV			+			
Soricidae	Crocidura	leucodon (Hermann, 1780)	Bicolored Shrew	II	CR	+	+			
Soricidae	Crocidura	suaveolens (Pallas, 1780)	Lesser Shrew	IV		+	+			
Vespertilionidae	Myotis	daubentonii (Kuhl, 1817)	Daubenton's Bat	IV		+	+		+	
Vespertilionidae	Nyctalus	leisleri (Kuhl, 1817)	Leisler's Bat	IV		+	+		+	
Vespertilionidae	Nyctalus	noctula (Schreber, 1774)	Noctule	IV			+		+	
Vespertilionidae	Pipistrellus	pipistrellus (Schreber, 1774)	Common Pipistrelle				+		+	
Vespertilionidae	Pipistrellus	nathusii (Keyserling & Blasius, 1839)	Nathusius' Pipistrelle	IV		+	+		+	
Vespertilionidae	Pipistrellus	pygmaeus (Leach, 1825)	Pygmy Pipistrelle				+		+	
Vespertilionidae	Plecotus	austriacus (Fischer, 1829)	Gray Big-eared Bat	IV			+		+	
Sciuridae	Sciurus	vulgaris Linnaeus, 1776	Eurasian Red Squirrel	VIII			+			
Sciuridae	Spermophilus	suslicus Guldenstaedt, 1770	Speckled Ground Squirrel			+				NT
Myoxidae	Dryomys	nitedula Pallas, 1773	Hazel Dormouse						+	
Myoxidae	Muscardinus	avellanarius Linnaeus, 1758							+	
Cricetidae	Cricetus	cricetus Linnaeus, 1758	Black-bellied Hamster			+			+	
Mustelidae	Mustela	erminea Linnaeus, 1758	Stoat	IV	VU	+	+			
Mustelidae	Mustela	nivalis Linnaeus 1766	Least Weasel	VIII			+			

Familia	Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat Directive A-IV	IUCN Red List 2013
Mustelidae	Martes	martes (Linnaeus,1758)	Pine Marten	IV	VU	+	+			
Mustelidae	Martes	foina Erxleben,1777	Beech Marten	VIII			+			
Mustelidae	Meles	meles Linnaeus,1758	Eurasian Badger	VIII		+	+			
Mustelidae	Lutra	lutra Linnaeus,1758	Eurasian Otter	II	CR	+	+		+	NT
Mustelidae	Felis	silvestris Schreber,1777	Wild Cat	III	EN	+	+			
Cervidae	Capreolus	capreolus Linnaeus,1758	European Roe Deer	VIII			+			
Cervidae	Cervus	elaphus Linnaeus,1758	Red Deer	VIII			+			
Cervidae	Cervus	nippon Temminck,1838	Sika Deer	VIII			+			
Cervidae	Cervus	dama Linnaeus,1758	Fallow deer	V			+			
	Eptescius	serotinus	serotine bat	IV						

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments

**Table 16-7: Protected bird species living in the reserve Plaiul Fagului**

Genus	Species	Common Name	Status of stay	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	CITES	Bern Convention	Bonn Convention	Birds Directive A-I	Birds Directive A-II	Birds Directive A-III	IUCN Red List 2013
Botaurus	stellaris L.	Eurasian Bittern	N	IV				Appendix II	•	Annex I			
Ixobrychus	minutus L.	Common Little Bittern	N					Appendix II	•	Annex I			
Nycticorax	nycticorax L.	Black-crowned Night heron	P					Appendix II		Annex I			
Egretta	garzetta L.	Little Egret	F					Appendix II		Annex I			
Egretta	alba L.	Great White Egret	F	II	CR			Appendix II		Annex I			
Ardea	cinerea L.	Grey Heron	F										
Ardea	purpurea L.	Purple Heron	N	IV				Appendix II	•	Annex I			
Ciconia	nigra L.	Black Stork	M	II	CR	+		Appendix II	•	Annex I			
Ciconia	ciconia L.	White Stork	F	VIII				Appendix II	•	Annex I			
Cygnus	olor Gmel.	Mute Swan	M	IV	VU	+			•		Annex II/2		
Anser	anser L.	Greylag Goose	P			+			•		Annex II/1	Annex III/1	
Anas	penelope L.	Eurasian Wigeon	P								Annex II/1	Annex III/1	
Anas	strepera L.	Gadwall	P								Annex II/1		
Anas	crecca L.		M								Annex II/1	Annex III/1	
Anas	platyrhynchos L.	Mallard	N								Annex II/1	Annex III/1	
Anas	querquedula L.	Garganey	N								Annex II/1		
Anas	clypeata L.	Northern Shoveler	P								Annex II/1	Annex III/1	
Aythya	ferina L.	Common Pochard	M								Annex II/1	Annex III/1	

Genus	Species	Common Name	Status of stay	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	CITES	Bern Convention	Bonn Convention	Birds Directive A-I	Birds Directive A-II	Birds Directive A-III	IUCN Red List 2013
Aythya	nyroca Guld.	Ferruginous Duck	P			+				Annex I			Near Threatened
Pernis	apivorus L.	European Honey-buzzard	N	III	EN	+		Appendix II	•	Annex I			
Milvus	migrans Bodd.	Black Kite	N	V		+		Appendix II	•	Annex I			
Circaetus	gallicus Gmel.	Short-toed Snake-eagle	P	II	CR	+		Appendix II	•	Annex I			
Circus	aeruginosus L.	Western Marsh-harrier	N	IV	IV			Appendix II	•	Annex I			
Circus	cyaneus L.	Hen Harrier	M	III	CR	+		Appendix II	•	Annex I			
Circus	pygargus L.	Montagu's Harrier	P	II	CR-II	+		Appendix II	•	Annex I			
Accipiter	gentilis L.	Northern Goshawk	N	V				Appendix II	•				
Accipiter	nisus L.	Eurasian Sparrowhawk	N	V				Appendix II	•				
Accipiter	brevipes L.	Levant Sparrowhawk	P	VII				Appendix II	•	Annex I			
Buteo	buteo L.	Eurasian Buzzard	N	VIII				Appendix II	•				
Buteo	lagopus Pont.	Rough-legged Buzzard	W	VIII				Appendix II	•				-
Aquila	pomarina Brehm.	Lesser Spotted Eagle	N	II	CR	+		Appendix II	•	Annex I			
Aquila	clanga Pall.	Greater Spotted Eagle	M	II	CR	+		Appendix II	•	Annex I			Vulnerable
Aquila	chrysaetos L.	Golden Eagle	M	II	CR			Appendix II	•	Annex I			-

Genus	Species	Common Name	Status of stay	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	CITES	Bern Convention	Bonn Convention	Birds Directive A-I	Birds Directive A-II	Birds Directive A-III	IUCN Red List 2013
Hieraaetus	pennatus Gmel.	Booted Eagle	N	II	CR	+		Appendix II	•	Annex I			
Falco	tinnunculus L.	Common Kestrel	N	VIII				Appendix II	•				
Falco	vespertinus L.	Red-footed Falcon	N	IV		+		Appendix II	•	Annex I			Near Threatened
Falco	subbuteo L.	Eurasian Hooby	N	VII				Appendix II	•				
Falco	cherrug Gray	Saker Falcon	P	II	CR	+		Appendix II	•	Annex I			Endangered
Falco	peregrinus Tunst.	Peregrine Falcon	M	V		+		Appendix II	•	Annex I			
Coturnix	coturnix L.	Common Quail	N						•	Annex II/2	Annex II/2		
Phasianus	colchicus L.	Common Pheasant	N	VIII						Annex II/1, Annex III/1	Annex II/1	Annex III/1	
Perdix	perdix L.	Grey Partridge	N								Annex II/1	Annex II/1, Annex III/1	
Rallus	aquaticus L.		P								Annex II/2		
Porzana	porzana L.		N			+		Appendix II	•	Annex I			
Porzana	parva Scop.		P			+		Appendix II	•	Annex I			
Crex	crex L.	Corncrake	N	VII				Appendix II	•	Annex I			
Gallinula	chloropus L.	Common Moorhen	N								Annex II/2		
Fulica	atra L.	Common Coot	N						•		Annex II/1	Annex III/1	
Grus	grus L.	Common Crane	P	V				Appendix II	•	Annex I			
Vanellus	vanellus L.	Northern Lapwing	N						•		Annex II/2		

Genus	Species	Common Name	Status of stay	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	CITES	Bern Convention	Bonn Convention	Birds Directive A-I	Birds Directive A-II	Birds Directive A-III	IUCN Red List 2013
Philomachus	pugnax L.		P						•	Annex I	Annex II/2		
Gallinago	gallinago L.	Common Snipe	P						•			Annex III/1	
Scolopax	rusticola L.	Eurasian Woodcock	M						•		Annex II/1	Annex III/1	
Tringa	totanus L.	Common Redshank	P						•		Annex II/2		
Tringa	nebularia Gunn.	Common Greenshank	P						•		Annex II/2		
Tringa	ochropus L.	Green Sandpiper	M					Appendix II	•				
Tringa	glareola L.	Wood Sandpiper	P					Appendix II	•	Annex I			
Actitis	hypoleucos L.	Common Sandpiper	P					Appendix II	•				
Larus	ridibundus L.		F								Annex II/2		
Larus	argentatus Pont.	European Herring Gull	P					Appendix III			Annex II/2		
Columba	livia Gmel.		N								Annex II/1		
Columba	oenas L.	Stock Dove	M	IV	EN	+					Annex II/2		
Columba	palumbus L.	Common Woodpigeon	N	VIII				Appendix III			Annex II/1	Annex III/1	
Streptopelia	decaocto Friv.		N								Annex II/2		
Streptopelia	turtur L.	European Turtle-dove	N						•		Annex II/2		
Otus	scops L.	Eurasian Scops-owl	N	IV				Appendix II					
Athene	noctua Scop.	Little Owl	N	VIII				Appendix II					
Strix	aluco L.	Tawny Owl	N	VIII				Appendix II					
Asio	otus L.	Northern	N	VII				Appendix II					

Genus	Species	Common Name	Status of stay	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	CITES	Bern Convention	Bonn Convention	Birds Directive A-I	Birds Directive A-II	Birds Directive A-III	IUCN Red List 2013
		Long-eared Owl											
Asio	flammeus Pont.	Short-eared Owl	P	III	EN	+		Appendix II		Annex I			
Caprimulgus	europaeus L.	European Nightjar	N	VII				Appendix II		Annex I			
Alcedo	atthis L.	Common Kingfisher	N	V				Appendix II		Annex I			
Merops	apiaster L.	European Bee-eater	N					Appendix II	•				
Coracias	garrulus L.	European Roller	P	VIII		+		Appendix II	•	Annex I			Near Threatened
Upupa	epops L.	Common Hoopoe	N	VIII				Appendix II					
Jynx	torquilla L.	Eurasian Wryneck	N					Appendix II					
Picus	canus Gmel.	Grey-faced Woodpecker	N					Appendix II		Annex I			
Dryocopus	martius L.		N	III	EN	+		Appendix II		Annex I			
Dendrocopos	major L.	Great Spotted Woodpecker	N					Appendix II					
Dendrocopos	syriacus Gengl et Ehrenb.	Syrian Woodpecker	N					Appendix II		Annex I			
Dendrocopos	medius L.		N					Appendix II		Annex I			
Dendrocopos	minor	Lesser Spotted Woodpecker	N					Appendix II					
Lullula	arborea L.	Wood Lark	N							Annex I			
Alauda	arvensis L.		N								Annex II/2		
Riparia	riparia L.	Sand Martin	P	VIII				Appendix II					

Genus	Species	Common Name	Status of stay	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	CITES	Bern Convention	Bonn Convention	Birds Directive A-I	Birds Directive A-II	Birds Directive A-III	IUCN Red List 2013
Hirundo	rustica L.	Barn Swallow	N					Appendix II					
Delichon	urbica L.	Northern House-martin	N					Appendix II					
Anthus	campestris L.	Tawny Pipit	N					Appendix II		Annex I			
Anthus	trivialis L.	Tree Pipit	N					Appendix II					
Anthus	pratensis L.	Meadow Pipit	P					Appendix II					
Motacilla	flava L.	Western Yellow Wagtail	N					Appendix II					
Motacilla	alba L.	White Wagtail	N					Appendix II					
Bombycilla	garrulus L.	Bohemian Waxwing	P					Appendix II					
Troglodytes	troglodytes L.	Winter Wren	N					Appendix II					
Prunella	modularis L.	Hedge Accentor	P					Appendix II					
Erithacus	rubecula L.	European Robin	N					Appendix II					
Luscinia	luscinia L.	Trush Nightingale	N					Appendix II					
Phoenicurus	ochruros Gmel.	Black Redstart	N					Appendix II					
Phoenicurus	phoenicurus L.	Common Redstart	N					Appendix II					
Saxicola	rubetra L.	Whinchat	P					Appendix II					
Saxicola	torquata L.	Common Stonechat	N					Appendix II					
Turdus	merula L.	Eurasian Blackbird	N								Annex II/2		
Turdus	pilaris L.	Fieldfare	M								Annex II/2		
Turdus	philomelos	Song Trush	N								Annex		



Genus	Species	Common Name	Status of stay	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	CITES	Bern Convention	Bonn Convention	Birds Directive A-I	Birds Directive A-II	Birds Directive A-III	IUCN Red List 2013
	Brehm										II/2		
Turdus	iliacus L.	Redwing	M								Annex II/2		
Turdus	viscivorus L.	Mistle Thrush	M								Annex II/2		
Locustella	naevia Bodd.	Common Grasshopper-warbler	N					Appendix II					
Locustella	fluviatilis Wolf		N					Appendix II					
Acrocephalus	palustris Bechst.		N					Appendix II					
Acrocephalus	scirpaceus Herm.		P					Appendix II					
Acrocephalus	arundinaceus L.	Great Reed-warbler	N					Appendix II					
Hippolais	icterina Vieill.	Icterine Warbler	N					Appendix II					
Sylvia	nisoria Bechst.	Barred Warbler	N					Appendix II		Annex I			
Sylvia	curruca L.		N										
Sylvia	communis Lath.	Common Whitethroat	N					Appendix II					
Sylvia	atricapilla L.	Blackcap	N					Appendix II					
Sylvia	borin Dodd.	Garden Warbler	N					Appendix II					
Phylloscopus	sibilatrix Bechst.	Wood Warbler	N					Appendix II					
Phylloscopus	collybita Vieill.	Common Chiffchaff	N					Appendix II					
Phylloscopus	trochilus L.	Willow Warbler	M					Appendix II					
Regulus	regulus L.	Goldcrest	P					Appendix II					

Genus	Species	Common Name	Status of stay	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	CITES	Bern Convention	Bonn Convention	Birds Directive A-I	Birds Directive A-II	Birds Directive A-III	IUCN Red List 2013
Muscicapa	striata Pall.	Spotted Flycatcher	N					Appendix II					
Ficedula	parva Bechst.	Red-breasted Flycatcher	N					Appendix II		Annex I			
Ficedula	albicollis Temm.	Collared Flycatcher	N					Appendix II		Annex I			
Ficedula	hypoleuca Pall.	European Pied Flycatcher	N					Appendix II					
Aegithalos	caudatus L.		N	VII									
Parus	palustris L.	Marsh Tit	N					Appendix II					
Parus	caeruleus L.	Blue Tit	N					Appendix II					
Parus	major L.	Great Tit	N					Appendix II					
Certhia	familiaris L.	Eurasian Treecreeper	N					Appendix II					
Lanius	collurio L.	Red-backed Shrike	N					Appendix II		Annex I			
Lanius	minor Gmel.	Lesser Grey Shrike	N					Appendix II		Annex I			
Lanius	excubitor L.	Great Grey Shrike	W					Appendix II					
Garrulus	glandarius L.	Eurasian Jay	N					Appendix III		Annex II/2	Annex II/2		
Pica	pica L.	Black-billed Magpie	N					Appendix III			Annex II/2		
Corvus	monedula L.	Eurasian Jackdaw	N					Appendix III			Annex II/2		
Corvus	frugilegus L.	Rook	F					Appendix III			Annex II/2		
Corvus	cornix L.	Hooded Crow	N					Appendix III			Annex II/2		
Sturnus	vulgaris L.	Common Starling	N					Appendix II			Annex II/2		

Genus	Species	Common Name	Status of stay	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	CITES	Bern Convention	Bonn Convention	Birds Directive A-I	Birds Directive A-II	Birds Directive A-III	IUCN Red List 2013
Passer	domesticus L.	House Sparrow	N					Appendix II					
Carduelis	chloris L.	European Greenfinch	N					Appendix II					
Carduelis	carduelis L.	European Goldfinch	N					Appendix II					
Carduelis	spinus L.		M										
Carduelis	cannabina L.	Eurasian Linnet	N					Appendix II					
Coccothraustes	coccothraustes L.	Hawfinch	N					Appendix II					
Emberiza	hortulana L.	Ortolan Bunting	N							Annex I			
Accipiter	badius Gm.	Shikra		VII			+	+					
Falco	columbarius L.	Merlin		V			+	+					
Panurus	biarmicus L.	Bearded Parrotbill		VII									
Picus	viridis	Eurasian Green Woodpecker		III	+								
Serinus	canaria	Island Canary		IV	+								
Strix	uralensis Pall.	Ural Owl		V			+						

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments

Birds - status of stay: N - nesting, M - during seasonal migration, W - during wintering, P - present (status of stay is unclear)

**Table 16-8: Protected amphibian and reptile species living in the reserve Plaiul Fagului**

Class	Familia	Genus	Species	Common Name	Law on Protected Areas*	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat at Direct	IUCN Red List
-------	---------	-------	---------	-------------	-------------------------	----------------------------	----------------------	-----------------	------------------------	-------------------	---------------

										ive A- IV	2013
Reptilia	Emididae	Emys	orbicularis L.	European Pond Turtle	IV	+	+	+	+	+	NT
Reptilia	Lacertidae	Lacerta	viridis Laur.	European Green Lizard				+		+	
Reptilia	Colubridae	Coronella	austriaca Laur.	Smooth Snake	VI	+	+	+		+	
Reptilia	Viperidae	Vipera	berus L.	Northern Viper	IV	+	+				
Amphibia	Salamandridae	Triturus	cristatus L.	northern crested newt	VIII		+		+	+	
Amphibia	Discoglossidae	Bombina	variegata L.	Yellow-bellied Toad				+	+	+	
Amphibia	Discoglossidae	Bombina	bombina L.	European fire-bellied toad	V		+	+	+	+	
Amphibia	Pelobatidae	Pelobates	fuscus Laur.	common spadefoot	IV	+	+	+		+	
Amphibia	Bufo	Bufo	viridis Laur.	European green toad				+		+	
Amphibia	Hylidae	Hyla	arborea L.	European tree frog				+		+	
Amphibia	Ranidae	Rana	dalmatina Bonap.	agile frog				+		+	

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments

**Table 16-9: Protected insect species living in the reserve Plaiul Fagului**

Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat Directive A-IV	IUCN Red List 2013
Mantis	Mantis religiosa L.	praying mantis	III	EN	+				
Calosoma	Calosoma sycophanta L.	forest caterpillar hunter	II	CR	+				
Porthmidius	Porthmidius austriacus Shr.		II	CR	+				
Oryctes	Oryctes nasicornis L.	European rhinoceros beetle	III	EN	+				
Lucanus	Lucanus cervus L.	Stag beetle	III	EN	+	+	+		
Cerambyx	Cerambyx cerdo L.	capricorn beetles	III	EN	+	+	+	+	VU
Morimus	Morimus funereus Muls.		III	EN	+		+		VU
Rosalia	Rosalia alpina L.	Rosalia longicorn	II	CR	+	+	+	+	VU
Xylocopa	Xylocopa valga Gerst.	Species of carpenter bee	III	EN	+				
Saturnia	Saturnia pyri Den. et Sch.	giant peacock moth	III	EN	+				
Marumba	Marumba quercus Den. et Sch.	Oak Hawk-moth	III	EN	+				
Callimorpha	Callimorpha quadripunctaria Poda	Jersey Tiger (moth)	III	VU	+		+		
Iphiclides	Iphiclides podalirius L.	Scarce Swallowtail	III	VU	+				
Papilio	Papilio machaon L.	Old World swallowtail	II	CR	+				
Carabus	Carabus intricatus Germ.				+				NT
Carabus	Carabus ullrichi Germ.				+				
Carabus	Carabus violaceus L.				+				
Gnorimus	Gnorimus octopunctatus F.				+				
Ocypus	Ocypus olens Mull.				+				
Aromia	Aromia moschata L.				+				
Dorcadion	Dorcadion equestre Laxm.				+				
Purpuricenus	Purpuricenus kaehleri L.				+				

Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat Directive A-IV	IUCN Red List 2013
Protaetia	Protaetia aeruginosa L.				+				
Apatura	Apatura ilia Den. et Sch.				+				
Argynnis	Argynnis pandora Den. et Sch.				+				
Catocala	Catocala sponsa L.				+				

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments

**Table 16-10: Protected plant species living in the reserve Plaiul Fagului**

Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat Directive A-IV	IUCN Red List 2013
Aconitum	lasostomum Reichenb.		IV		+				
Actaea	spicata L.	Christophskraut	VIII		+				
Adonis	vernalis L.		III		+				
Alchemilla	gracilis Opiz				+				
Allium	paniculatum L.				+				
Allium	ursinum L.	bear garlic			+				
Anemone	sylvestris L.				+				
Anemonoides	nemorosa (L.) Holub	Wood anemone	III		+				
Anthericum	ramosum L.	wood anemone			+				
Asparagus	officinalis L.	Asparagus	II		+				
Asparagus	tenuifolius Lam.	Asparagus	II		+				
Aster	amellus L.	European Michaelmas Daisy			+				
Athyrium	filix-femina (L.) Roth	common lady-fern	III	VU	+				

Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat Directive A-IV	IUCN Red List 2013
Briza	media L.	Quaking-grass	II		+				
Carex	caryophyllea Latourr.				+				
Carex	pallesces L.	pale sedge			+				
Carex	pendula Huds.	pendulous sedge	IV		+				
Carex	supina Willd. ex Wahlenb.				+				
Carpesium	cernuum L.				+				
Cephalanthera	damasonium (Mill.) Druce	White Helleborine	II	VU	+				
Cephalanthera	longifolia (L.) Fritsch	Sword-leaved Helleborine	III	VU	+				
Cephalanthera	rubra (L.) Rich.	Red Helleborine	II	CR	+				
Cerastium	brachypetalum Desp. ex Pers.				+				
Chrysopogon	gryllus (L.) Trin.	perennial bunchgrass	II	VU	+				
Cirsium	canum (L.) All.	Queen Anne's thistle			+				
Coronaria	coriacea (Moench) Schischk. et Gorschk.	crown pink			+				
Crocus	reticulatus Stev. ex Adams		II		+				
Cypripedium	calceolus L.	lady's slipper orchid	II	CR	+	+			
Dactylorhiza	majalis (Reichenb.) P.F.Hunt et Summerhayes		II	CR	+				
Daphne	mezereum L.	February daphne	II-III	CR	+				
Dentaria	glandulosa Waldst. et Kit.		IV	VU	+				
Dentaria	quinquefolia Bieb.		IV	EN	+				
Dianthus	carthusianorum L.		IV		+				

Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat Directive A-IV	IUCN Red List 2013
Doronicum	hungaricum Reichenb.fil.		VIII	VU	+				
Dryopteris	carthusiana (Vill.) H.P.Fuchs	narrow buckler-fern	III	EN	+				
Dryopteris	caucasica (A.Br.) Fraser-Jenkins et Corley		IV						
Dryopteris	austriaca (Jacq.) Woytnar	Spiny Wood Fern	IV		+				
Dryopteris	filix-mas (L.) Schott	worm fern	IV		+				
Epipactis	atrorubens (Hoffm. ex Bernh. ) Bess.	Dark-red Helleborine	VIII		+				
Epipactis	helleborine (L.) Crantz	broad-leaved helleborine	VIII		+				
Epipactis	purpurata Smith	Violet Helleborine	IV	VU	+				
Euonymus	nana Bieb.	Turkestan Burning Bush	III-IV	VU	+				
Fagus	sylvatica L.	European beech	IV						
Galanthus	nivalis L.	Snowdrop	III	VU	+				
Genistella	sagittalis (L.) Gams		I	CR	+				
Gentiana	cruciata L.				+				
Gymnadenia	conopsea (L.) R.Br.				+				
Gymnocarpium	dryopteris (L.) Newm.	Western Oakfern	II	CR	+				
Gypsophila	elegans Bieb.	annual baby's-breath	IV						
Helichrysum	arenarium (L.) Moench	warf everlast	II		+				
Helictotrichon	pubescens (Huds.) Pilg.				+				
Hypericum	montanum L.	pale St. John's-wort	IV						
Hypericum	quadrangulum L.	spotted St. Johnswort	IV		+				



Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat Directive A-IV	IUCN Red List 2013
Hypopitys	monotropa Crantz	Dutchman's pipe	II	CR	+				
Impatiens	noli-tangere L.	touch-me-not balsam	IV		+				
Juncus	effusus L.				+				
Lathyrus	venetus (Mill.) Wohlf.		IV		+				
Lilium	martagon L.	martagon lily	VIII		+				
Listera	ovata (L.) R.Br.	greater twayblade	IV		+				
Lunaria	rediviva L.	perennial honesty	II	EN	+				
Luzula	campestris (L.) DC.	field wood-rush	IV		+				
Luzula	multiflora (Ehrh.) Lej.				+				
Luzula	pallescens Sw.				+				
Maianthemum	bifolium (L.) F.W.Schmidt	May lily	II	CR	+				
Neottia	nidus-avis (L.) Rich.		VIII		+				
Orchis	palustris Jacq.	bog orchid	II	EN	+				
Orchis	purpurea Huds.	lady orchid	II	EN	+				
Ornithogalum	kochii Parl.				+				
Orthilia	secunda (L.) House	sidebells wintergreen	IV		+				
Padus	avium Mill.		III-IV	EN	+				
Paris	quadrifolia L.	True Lover's Knot	II		+				
Petasites	hybridus (L.) Gaertn., Mey. et Scherb.	butterbur	II		+				
Platanthera	bifolia (L.) Rich.	butterfly-orchid	II						
Platanthera	chlorantha (Cust.) Reichenb.	greater butterfly-orchid	II		+				
Polystichum	aculeatum (L.) Roth	Hard Shield Fern	II	EN	+				

Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat Directive A-IV	IUCN Red List 2013
Potamogeton	lucens L.				+				
Prunella	grandiflora (L.) Scholl.				+				
Pulsatilla	montana (Hoppe) Reichenb.	pasque flower	IV		+				
Pyrola	rotundifolia L.	round-leaved wintergreen	IV		+				
Rhinanthus	minor L.				+				
Rubus	idaeus L.				+				
Scopolia	carniolica Jacq.	European scopolia	IV	VU	+				
Scorzonera	purpurea L.	red black salsify	VIII		+				
Scrophularia	umbrosa Dumort.	green figwort	IV		+				
Scrophularia	vernalis L.	yellow figwort	IV		+				
Seseli	libanotis (L.) Koch	Mooncarrot	I		+				
Sorbus	domestica L.	service tree	IV	EN	+				
Sorbus	torminalis (L.) Crantz	wild service tree	VIII		+				
Staphylea	pinnata L.	(European) bladdernut	IV		+				
Telekia	speciosa (Schreb.) Baumg.	Big telekie	IV		+				
Thalictrum	lucidum L.				+				
Thelypteris	palustris Schott	marsh fern	III-IV	EN	+				
Tulipa	biebersteiniana Schult. et Schult.fil.		IV		+				
Typha	laxmannii Lepech.	Graceful Cattail	IV		+				
Valerianella	costata (Stev.) Betcke				+				
Vinca	minor L.		II		+				

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments



### 16.1.3 Landscape Reserve Cazimir-Milesti

**Table 16-11: Protected mammal species living in the reserve Cazimir-Milesti**

<b>Familia</b>	<b>Genus</b>	<b>Species</b>	<b>Common Name</b>	<b>Law on Protected Areas *</b>	<b>Moldova Red Data Book 2001</b>	<b>CITES</b>	<b>Bern Convention</b>	<b>Bonn Convention</b>	<b>IUCN Red List 2013</b>
Soricidae	Sorex	minutus Linnaeus, 1766	Euroasian Pygmy Shrew	IV					
Vespertilionidae	Nyctalus	noctula (Schreber, 1774)	Noctule	IV					
Cricetidae	Cricetus	cricetus Linnaeus, 1758	Black-bellied Hamster				+		
Mustelidae	Martes	martes (Linnaeus, 1758)	Pine Marten	IV	+				
Mustelidae	Felis	silvestris Schreber, 1777	Wild Cat	III	+				

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments

**Table 16-12: Protected bird species living in the reserve Cazimir-Milesti**

Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	CITES	Bern Convention	Bonn Convention	IUCN Red List 2013
Accipiter	Gentilis	Northern Goshawk	V		+			
Accipiter	nisus	Eurasian Sparrowhawk	V		+			
Asio	Otus	Northern Long-eared Owl	VII		+			
Buteo	Buteo	Eurasian Buzzard	VIII		+			
Buteo	Lagopus	Rough-legged Buzzard	VIII		+			
Dendrocopos	Siriactus	Syrian Woodpecker				+		
Emberiza	Hortulana	Ortolan Bunting				+		
Falco	subbuteo	Eurasian Hobby	VII		+			
Falco	Tinnunculus	Common Kestrel	VIII		+			
Ficedula	Albicollis	Collared Flycatcher				+		
Lanius	Collurio	Red-backed Shrike				+		
Merops	Apiaster	European Bee-eater					+	
Muscicapa	Striata	Spotted Flycatcher					+	
Picus	Canus	Grey-faced Woodpecker				+		
Streptopelia	Turtur (L)	European turtle dove			+		+	VU
Strix	Aluco L.	Tawny Owl	VIII		+			
Sylvia	Nisoria (Bechst)	Barred Warbler				+		

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments

**Table 16-13: Protected amphibian and reptile species living in the reserve Cazimir-Milesti**

<b>Familia</b>	<b>Genus</b>	<b>Species</b>	<b>Common Name</b>	<b>Law on Protected Areas*</b>	<b>Moldova Red Data Book 2001</b>	<b>CITES</b>	<b>Bern Convention</b>	<b>IUCN Red List 2013</b>
Emididae	Emys	orbicularis L.	European Pond Turtle				+	NT
Lacertidae	Lacerta	viridis Laur.	European Green Lizard				+	
Lacertidae	Lacerta	agilis L.	Sand Lizard				+	
Colubridae	Natrix	natrix L.	Grass snake	III				
Colubridae	Coronella	austriaca Laur.	Smooth Snake	IV			+	
Viperidae	Vipera	berus L.	Northern Viper	IV				
Salamandridae	Triturus	cristatus L.	northern crested newt				+	
Discoglossidae	Bombina	bombina L.	European fire-bellied toad	V			+	
Pelobatidae	Pelobates	fuscus Laur.	common spadefoot	IV			+	
Bufonidae	Bufo	viridis Laur.	European green toad				+	
Hylidae	Hyla	arborea L.	European tree frog				+	
Ranidae	Rana	dalmatina Bonap.	agile frog				+	

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments

**Table 16-14: Protected insect species living in the reserve Cazimir-Milesti**

Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	CITES	Bern Convention	Bonn Convention	IUCN Red List 2013
Oryctes	Nasicornis	European rhinoceros beetle	III	+				
Lucanus	Cervus	Stag beetle	III	+		III		
Iphiclides	Podalirius	Scarce Swallowtail	III	+				
Xylocopa	Valga	Species of carpenter bee	III	+				
Zerynthia	Polyxena	Southern Festoon	II	+		II		

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments

**Table 16-15: Protected plant species living in the reserve Cazimir-Milesti**

Genus	Species	Common Name	Law on Protected Areas *	Moldovan Red Data Book 2001	CITES	Bern Convention	Bonn Convention	IUCN Red List 2013
Asparagus	Tenuifolius Lam.	Asparagus	II					
Carex	Pendula Huds.	pendulous sedge	IV					
Cephalanthera	Damasonium (Mill.)	White Helleborine	II	+				
Cephalanthera	Longifolia (L.)	Narrow-leaved Helleborine	III	+				
Dentaria	Glandulosa		IV	+				
Dryopteris	is filix mas (L.)	male fern	IV					
Platanthera	Bifolia (L.)	lesser butterfly-orchid	II					
Scopolia	Carniolica	European scopolia	IV	+				
Staphilea	Pinnata (L.)	bladdernut	IV					

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments



#### 16.1.4 Scientific Reserve Codrill

**Table 16-16: Protected mammal species living in the reserve Codrii**

Ordo	Familia	Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat Directive A-IV	IUCN Red List 2013
Eulipotyphla	Erinaceidae	Erinaceus	europaeus (Linnaeus, 1758)	European Hedgehog	VIII		+	+			
Eulipotyphla	Soricidae	Sorex	araneus Linnaeus, 1758	Euroasian shrew	VIII			+			
Eulipotyphla	Soricidae	Sorex	minutus Linnaeus, 1766	Euroasian Pygmy Shrew	IV			+			
Eulipotyphla	Soricidae	Crocidura	leucodon (Hermann, 1780)	Bicolored Shrew	II	CR	+	+			
Eulipotyphla	Soricidae	Crocidura	suaveolens (Pallas, 1780)	Lesser Shrew	IV		+	+			
Chiroptera	Vespertilionidae	Myotis	daubentonii (Kuhl, 1817)	Daubenton's Bat	IV		+	+		+	
Chiroptera	Vespertilionidae	Nyctalus	leisleri (Kuhl, 1817)	Leisler's Bat	IV		+	+		+	
Chiroptera	Vespertilionidae	Nyctalus	lasipterus (Schreber, 1780)	Greater Noctule Bat	II	CR	+	+		+	NT
Chiroptera	Vespertilionidae	Nyctalus	noctula (Schreber, 1774)	Noctule	IV			+		+	
Chiroptera	Vespertilionidae	Pipistrellus	pipistrellus (Schreber, 1774)	Common Pipistrelle				+		+	
Chiroptera	Vespertilionidae	Pipistrellus	nathusii (Keyserling & Blasius, 1839)	Nathusius' Pipistrelle	IV		+	+		+	
Chiroptera	Vespertilionidae	Pipistrellus	pygmaeus (Leach, 1825)	Pygmy Pipistrelle				+		+	
Chiroptera	Vespertilionidae	Plecotus	austriacus (Fischer, 1829)	Gray Big-eared Bat	IV			+		+	
Rodentia	Sciuridae	Sciurus	vulgaris Linnaeus, 1776	Eurasian Red Squirrel	VIII			+			
Rodentia	Myoxidae	Dryomys	nitedula Pallas, 1773	Forest Dormouse						+	
Rodentia	Myoxidae	Muscardinus	avellanarius Linnaeus, 1758	Hazel Dormouse						+	
Rodentia	Cricetidae	Cricetus	cricetus	Black-bellied			+			+	

Ordo	Familia	Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat Directive A-IV	IUCN Red List 2013
			Linnaeus, 1758	Hamster							
Carnivora	Mustelidae	Mustela	nivalis Linnaeus 1766	Least Weasel	VIII			+			
Carnivora	Mustelidae	Martes	martes (Linnaeus, 1758)	Pine Marten	IV	VU	+	+			
Carnivora	Mustelidae	Martes	foina Erxleben, 1777	Beech Marten	VIII			+			
Carnivora	Mustelidae	Meles	meles Linnaeus, 1758	Eurasian Badger	VIII		+	+			
Carnivora	Mustelidae	Felis	silvestris Schreber, 1777	Wild Cat	III	EN	+	+			
Artiodactyla	Cervidae	Capreolus	capreolus Linnaeus, 1758	European Roe Deer	VIII			+			
Artiodactyla	Cervidae	Cervus	elaphus Linnaeus, 1758	Red Deer	VIII			+			
Artiodactyla	Cervidae	Cervus	nippon Temminck, 1838	Sika Deer	VIII			+			
Artiodactyla	Cervidae	Cervus	dama Linnaeus, 1758	Fallow deer	V			+			

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments

**Table 16-17: Protected bird species living in the reserve Codrii**

Ordo	Common Name	Status of stay	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Bonn Convention	Birds Directive A-I	Birds Directive A-II	Birds Directive A-III	IUCN Red List 2013
Ciconiiformes	Little Egret	P				Appendix II		Annex I			
Ciconiiformes	Great White Egret	P	II	CR		Appendix II		Annex I			
Ciconiiformes	Purple Heron	P	IV			Appendix II	•	Annex I			
Ciconiiformes	Black Stork	M	II	CR	+	Appendix II	•	Annex I			
Ciconiiformes	White Stork	F	VIII			Appendix II	•	Annex I			
Anseriformes	Mute Swan	P	IV	VU	+		•		Annex II/2		
Anseriformes	Greylag Goose	P			+		•		Annex II/1	Annex III/1	
Anseriformes	Eurasian Wigeon	P							Annex II/1	Annex III/1	
Anseriformes	Gadwall	P							Annex II/1		
Anseriformes	Mallard	M							Annex II/1	Annex III/1	
Anseriformes	Garganey	P							Annex II/1		
Anseriformes	Northern Shoveler	P							Annex II/1	Annex III/1	
Anseriformes	Common Pochard	P							Annex II/1	Annex III/1	
Anseriformes	Ferruginous Duck	P			+			Annex I			Near Threatened
Accipitriformes	European Honey-buzzard	M	III	EN	+	Appendix II	•	Annex I			
Accipitriformes	Black Kite	N	V		+	Appendix II	•	Annex I			
Accipitriformes	Short-toed Snake-	P	II	CR	+	Appendix II	•	Annex I			

Ordo	Common Name	Status of stay	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Bonn Convention	Birds Directive A-I	Birds Directive A-II	Birds Directive A-III	IUCN Red List 2013
	eagle										
Accipitriformes	Western Marsh-harrier	P	IV	IV		Appendix II	•	Annex I			
Accipitriformes	Hen Harrier	M	III	CR	+	Appendix II	•	Annex I			
Accipitriformes	Montagu's Harrier	P	II	CR-II	+	Appendix II	•	Annex I			
Accipitriformes	Northern Goshawk	N	V			Appendix II	•				
Accipitriformes	Eurasian Sparrowhawk	N	V			Appendix II	•				
Accipitriformes	Levant Sparrowhawk	P	VII			Appendix II	•	Annex I			
Accipitriformes	Eurasian Buzzard	N	VIII			Appendix II	•				
Accipitriformes	Rough-legged Buzzard	W	VIII			Appendix II	•				
Accipitriformes	Lesser Spotted Eagle	M	II	CR	+	Appendix II	•	Annex I			
Accipitriformes	Greater Spotted Eagle	M	II	CR	+	Appendix II	•	Annex I			Vulnerable
Accipitriformes	Golden Eagle	P	II	CR		Appendix II	•	Annex I			
Accipitriformes	Booted Eagle	M	II	CR	+	Appendix II	•	Annex I			
Accipitriformes	Common Kestrel	N	VIII			Appendix II	•				
Accipitriformes	Red-footed Falcon	P	IV		+	Appendix II	•	Annex I			Near Threatened
Accipitriformes	Eurasian Hooby	N	VII			Appendix II	•				

Ordo	Common Name	Status of stay	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Bonn Convention	Birds Directive A-I	Birds Directive A-II	Birds Directive A-III	IUCN Red List 2013
Accipitriformes	Saker Falcon	M	II	CR	+	Appendix II	•	Annex I			Endangered
Accipitriformes	Peregrine Falcon	M	V		+	Appendix II	•	Annex I			
Galliformes	Common Quail	N					•	Annex II/2	Annex II/2		
Galliformes	Common Pheasant	N	VIII					Annex II/1, Annex III/1	Annex II/1	Annex III/1	
Galliformes	Grey Partridge	N							Annex II/1	Annex II/1, Annex III/1	
Gruiformes	Corncrake	N	VII			Appendix II	•	Annex I			Near Threatened
Gruiformes	Common Moorhen	N							Annex II/2		
Gruiformes	Common Coot	P					•		Annex II/1	Annex III/1	
Gruiformes	Common Crane	P	V			Appendix II	•	Annex I			
Haradriiformes	Northern Lapwing	M					•		Annex II/2		
Haradriiformes	Common Snipe	P					•			Annex III/1	
Haradriiformes	Eurasian Woodcock	M					•		Annex II/1	Annex III/1	
Haradriiformes	Common Redshank	P					•		Annex II/2		
Haradriiformes	Common Greenshank	P					•		Annex II/2		
Haradriiformes	Green Sandpiper	M				Appendix II	•				
Haradriiformes	Wood Sandpiper	P				Appendix II	•	Annex I			
Haradriiformes	Common Sandpiper	P				Appendix II	•				
Haradriiformes		P							Annex II/2		

Ordo	Common Name	Status of stay	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Bonn Convention	Birds Directive A-I	Birds Directive A-II	Birds Directive A-III	IUCN Red List 2013
Haradriiformes	European Herring Gull	P				Appendix III			Annex II/2		
Columbiformes		N							Annex II/1		
Columbiformes	Stock Dove	M	IV	EN	+				Annex II/2		
Columbiformes	Common Woodpigeon	N	VIII			Appendix III			Annex II/1	Annex III/1	
Columbiformes		N							Annex II/2		
Columbiformes	European Turtle-dove	N					•		Annex II/2		
Strigiformes	Eurasian Scops-owl	N	IV			Appendix II					
Strigiformes	Little Owl	N	VIII			Appendix II					
Strigiformes	Tawny Owl	N	VIII			Appendix II					
Strigiformes	Northern Long-eared Owl	N	VII			Appendix II					
Strigiformes	Short-eared Owl	M	III	EN	+	Appendix II		Annex I			
Caprimulgiformes	European Nightjar	N	VII			Appendix II		Annex I			
Coraciiformes	Common Kingfisher	P	V			Appendix II		Annex I			
Coraciiformes	European Bee-eater	F				Appendix II	•				
Coraciiformes	European Roller	P	VIII		+	Appendix II	•	Annex I			Near Threatened
Coraciiformes	Common Hoopoe	N	VIII			Appendix II					
Piciformes	Eurasian Wryneck	N				Appendix II					
Piciformes	Grey-faced Woodpecker	N				Appendix II		Annex I			

Ordo	Common Name	Status of stay	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Bonn Convention	Birds Directive A-I	Birds Directive A-II	Birds Directive A-III	IUCN Red List 2013
	r										
Piciformes	Great Spotted Woodpecker	N				Appendix II					
Piciformes	Syrian Woodpecker	N				Appendix II		Annex I			
Piciformes	Lesser Spotted Woodpecker	N				Appendix II					
Passeriformes	Wood Lark	N						Annex I			
Passeriformes		N							Annex II/2		
Passeriformes	Sand Martin	P	VIII			Appendix II					
Passeriformes	Barn Swallow	N				Appendix II					
Passeriformes	Northern House-martin	N				Appendix II					
Passeriformes	Tawny Pipit	P				Appendix II		Annex I			
Passeriformes	Tree Pipit	N				Appendix II					
Passeriformes	Meadow Pipit	P				Appendix II					
Passeriformes	Western Yellow Wagtail	P				Appendix II					
Passeriformes	White Wagtail	N				Appendix II					
Passeriformes	Bohemian Waxwing	P				Appendix II					



Ordo	Common Name	Status of stay	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Bonn Convention	Birds Directive A-I	Birds Directive A-II	Birds Directive A-III	IUCN Red List 2013
Passeriformes	Winter Wren	N				Appendix II					
Passeriformes	Hedge Accentor	P				Appendix II					
Passeriformes	European Robin	N				Appendix II					
Passeriformes	Trush Nightingale	N				Appendix II					
Passeriformes	Black Redstart	N				Appendix II					
Passeriformes	Common Redstart	N				Appendix II					
Passeriformes	Whinchat	P				Appendix II					
Passeriformes	Common Stonechat	N				Appendix II					
Passeriformes	Eurasian Blackbird	N							Annex II/2		
Passeriformes	Fieldfare	M							Annex II/2		
Passeriformes	Song Trush	N							Annex II/2		
Passeriformes	Redwing	M							Annex II/2		
Passeriformes	Mistle Thrush	M							Annex II/2		
Passeriformes	Common Grasshopper-warbler	P				Appendix II					
Passeriformes	Eurasian River Warbler	P				Appendix II					
Passeriformes	Great Reed-warbler	N				Appendix II					
Passeriformes	Icterine Warbler	N				Appendix II					

Ordo	Common Name	Status of stay	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Bonn Convention	Birds Directive A-I	Birds Directive A-II	Birds Directive A-III	IUCN Red List 2013
Passeriformes	Barred Warbler	N				Appendix II		Annex I			
Passeriformes	Common Whitethroat	N				Appendix II					
Passeriformes	Blackcap	N				Appendix II					
Passeriformes	Garden Warbler	N				Appendix II					
Passeriformes	Wood Warbler	N				Appendix II					
Passeriformes	Common Chiffchaff	N				Appendix II					
Passeriformes	Willow Warbler	M				Appendix II					
Passeriformes	Goldcrest	P				Appendix II					
Passeriformes	Spotted Flycatcher	N				Appendix II					
Passeriformes	Red-breasted Flycatcher	N				Appendix II		Annex I			
Passeriformes	Collared Flycatcher	N				Appendix II		Annex I			
Passeriformes	European Pied Flycatcher	M				Appendix II					
Passeriformes	Marsh Tit	N				Appendix II					
Passeriformes	Blue Tit	N				Appendix II					
Passeriformes	Great Tit	N				Appendix II					
Passeriformes	Eurasian Treecreeper	N				Appendix II					
Passeriformes	Red-backed Shrike	N				Appendix II		Annex I			

Ordo	Common Name	Status of stay	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Bonn Convention	Birds Directive A-I	Birds Directive A-II	Birds Directive A-III	IUCN Red List 2013
Passeriformes	Lesser Grey Shrike	N				Appendix II		Annex I			
Passeriformes	Great Grey Shrike	P				Appendix II					
Passeriformes	Eurasian Jay	N				Appendix III		Annex II/2	Annex II/2		
Passeriformes	Black-billed Magpie	N				Appendix III			Annex II/2		
Passeriformes	Eurasian Jackdaw	P				Appendix III			Annex II/2		
Passeriformes	Rook	F				Appendix III			Annex II/2		
Passeriformes	Hooded Crow	N				Appendix III			Annex II/2		
Passeriformes	Common Starling	N				Appendix II			Annex II/2		
Passeriformes	House Sparrow	N				Appendix II					
Passeriformes	European Greenfinch	N				Appendix II					
Passeriformes	European Goldfinch	N				Appendix II					
Passeriformes	Eurasian Linnet	N				Appendix II					
Passeriformes	Hawfinch	N				Appendix II					
Passeriformes	Ortolan Bunting	N						Annex I			

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments

Birds - status of stay: N - nesting, M - during seasonal migration, W - during wintering, P - present (status of stay is unclear)

**Table 16-18: Protected amphibian and reptile species living in the reserve Codrii**

Class	Familia	Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat Directive A-IV	IUCN Red List 2013
Reptilia	Emididae	Emys	orbicularis L.	European Pond Turtle	IV	+	+	+	+	+	NT
Reptilia	Lacertidae	Lacerta	viridis Laur.	European Green Lizard				+		+	
Reptilia	Lacertidae	Lacerta	agilis L.	Sand Lizard				+		+	
Reptilia	Colubridae	Coronella	austriaca Laur.	Smooth Snake	VI	+	+	+		+	
Reptilia	Viperidae	Vipera	berus L.	Northern Viper	IV	+	+				
Amphibia	Salamandridae	Triturus	cristatus L.	northern crested newt	VIII		+		+	+	
Amphibia	Discoglossidae	Bombina	bombina L.	European fire-bellied toad	V		+	+	+	+	
Amphibia	Pelobatidae	Pelobates	fuscus Laur.	common spadefoot	IV	+	+	+		+	
Amphibia	Bufo	Bufo	viridis Laur.	European green toad				+		+	
Amphibia	Hylidae	Hyla	arborea L.	European tree frog				+		+	
Amphibia	Ranidae	Rana	dalmatina Bonap.	agile frog				+		+	

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments

**Table 16-19: Protected insect species living in the reserve Codrii**

Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat Directive A-IV	IUCN Red List 2013
Mantis	Mantis religiosa L.	praying mantis	III	EN	+				
Calosoma	Calosoma sycophanta L.	forest caterpillar hunter	II	CR	+				
Elater	Elater ferrugineus L.	Red click beetle	III	EN	+				
Oryctes	Oryctes nasicornis L.	European rhinoceros beetle	III	EN	+				
Lucanus	Lucanus cervus L.	Stag beetle	III	EN	+	+	+		
Cerambyx	Cerambyx cerdo L.	capricorn beetles	III	EN	+	+	+	+	VU
Morimus	Morimus funereus Muls.		III	EN	+		+		VU
Rhopitoides	Rhopitoides canus Eversm.		III		+				
Aglia	Aglia tau L.	Tau Emperor	III	EN	+				
Eudia	Eudia pavonia L.	Small Emperor Moth	III	EN	+				
Saturnia	Saturnia pyri Den. et Sch.	giant peacock moth	III	EN	+				
Marumba	Marumba quercus Den. et Sch.	Oak Hawk-moth	III	EN	+				
Callimorpha	Callimorpha quadripunctaria Poda	Jersey Tiger (moth)	III	VU	+		+		
Iphiclides	Iphiclides podalirius L.	Scarce Swallowtail	III	VU	+				
Papilio	Papilio machaon L.	Old World swallowtail	II	CR	+				
Parnassius	Parnassius mnemosyne L.	Clouded Apollo (butterfly)	II	CR	+	+		+	
Zerynthia	Zerynthia polyxena Den. et Sch.	Southern Festoon (butterfly)	II	CR	+	+		+	
Polyommatus	Polyommatus daphnis Den. et Sch.	Meleager's blue (butterfly)	II	CR	+				
Picromerus	Picromerus conformis H.-S.				+				
Carabus	Carabus hungaricus F.				+				

Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat Directive A-IV	IUCN Red List 2013
Carabus	Carabus intricatus Germ.				+				NT
Carabus	Carabus ullrichi Germ.				+				
Carabus	Carabus variolosus F.				+				
Carabus	Carabus violaceus L.				+				
Gnorimus	Gnorimus octopunctatus F.				+				
Ocypus	Ocypus olens Mull.				+				
Aromia	Aromia moschata L.				+				
Protaetia	Protaetia aeruginosa L.				+				
Apatura	Apatura iris L.				+				
Nymphalis	Nymphalis xanthomelas Esp.				+				
Neozephyrus	Neozephyrus quercus L.				+				
Catocala	Catocala sponsa L.				+				
Andrena	Andrena bulgariensis War.				+				
Melitturga	Melitturga clavicornis Latr.				+				
Xylocopa	Xylocopa violacea L.				+				

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments

**Table 16-20: Protected plant species living in the reserve Codrii**

Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat Directive A-IV	IUCN Red List 2013
Aconitum	anthora L.		IV		+				
Aconitum	lasiosomum Reichenb.		IV		+				
Actaea	spicata L.	Christophskraut	VIII		+				
Allium	ursinum L.	bear garlic			+				
Asparagus	officinalis L.	Asparagus	II		+				
Asparagus	polyphyllus Stev.	Asparagus	IV						
Asparagus	tenuifolius Lam.	Zartblättriger Spargel	II		+				
Asplenium	trichomanes L.	maidenhair spleenwort	VIII		+				
Aster	amellus L.	European Michaelmas Daisy			+				
Astragalus	dasyanthus Pall.	?	IV	VU	+				
Athyrium	filix-femina (L.) Roth	common lady-fern	III	VU	+				
Briza	media L.	Quaking-grass	II		+				
Carex	divisa Huds.	divided sedge			+				
Carex	elongata L.	elongated sedge			+				
Carex	pallesces L.	pale sedge			+				
Carex	paniculata L.	greater tussock-sedge	IV		+				
Carex	pendula Huds.	pendulous sedge	IV		+				
Carpesium	cernuum L.	?			+				
Cephalanthera	damasonium (Mill.) Druce	White Helleborine	II	VU	+				
Cephalanthera	longifolia (L.) Fritsch	Sword-leaved	III	VU	+				

Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat Directive A-IV	IUCN Red List 2013
		Helleborine							
Cephalanthera	rubra (L.) Rich.	Red Helleborine	II	CR	+				
Chrysopogon	gryllus (L.) Trin.	perennial bunchgrass	II	VU	+				
Cirsium	canum (L.) All.	Queen Anne's thistle			+				
Coronaria	coriacea (Moench) Schischk. et Gorschk.	crown pink			+				
Crataegus	pentagyna Waldst. et Kit.	small-flowered black hawthorn	III-IV	CR	+				
Cruciata	pedemontana (Bell.) Ehrend.	Piedmont bedstraw			+				
Cypripedium	calceolus L.	lady's slipper orchid	II	CR	+	+			
Dactylorhiza	majalis (Reichenb.) P.F.Hunt et Summerhayes	western marsh orchid	II	CR	+				
Delphinium	fissum Valdst. et Kit.	Casey's Larkspur	II	CR	+				
Dentaria	glandulosa Waldst. et Kit.		IV	VU	+				
Dentaria	quinquefolia Bieb.		IV	EN	+				
Doronicum	hungaricum Reichenb.fil.		VIII	VU	+				
Dryopteris	carthusiana (Vill.) H.P.Fuchs	narrow buckler-fern	III	EN	+				
Dryopteris	caucasica (A.Br.) Fraser-Jenkins et Corley		IV						
Dryopteris	filix-mas (L.) Schott	worm fern	IV		+				
Epipactis	atrorubens (Hoffm. ex Bernh. ) Bess.	Dark-red Helleborine	VIII		+				
Epipactis	helleborine (L.) Crantz	broad-leaved helleborine	VIII		+				
Epipactis	palustris (L.) Crantz	Marsh Helleborine	II	EN	+				
Epipactis	purpurata Smith	Violet Helleborine	IV	VU	+				



Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat Directive A-IV	IUCN Red List 2013
Eriophorum	latifolium Hoppe	Broad leaved cotton grass	III-IV	EN	+				
Euphorbia	volhynica Bess. ex Racib.				+				
Fagus	sylvatica L.	European beech	IV						
Galanthus	nivalis L.	Snowdrop	III	VU	+				
Galium	rubroides L.	European bedstraw			+				
Gentiana	cruciata L.	star gentian			+				
Gymnocarpium	dryopteris (L.) Newm.	Western Oakfern	II	CR	+				
Hesperis	pycnotricha Borb. et Degen	?			+				
Hesperis	tristis L.	?			+				
Hypericum	quadrangulum L.	spotted St. Johnswort	IV		+				
Hypopitys	monotropa Crantz	Dutchman's pipe	II	CR	+				
Impatiens	noli-tangere L.	touch-me-not balsam	IV		+				
Iris	variegata L.	Hungarian Iris	VIII		+				
Juncus	effusus L.	common rush			+				
Lathyrus	aphaca L.	yellow pea			+				
Lathyrus	aureus (Stev.) Brandza	Yellow Vetchling			+				
Lathyrus	venetus (Mill.) Wohlf.		IV		+				
Lilium	martagon L.	martagon lily	VIII		+				
Linum	nervosum Waldst. et Kit.	?			+				
Listera	ovata (L.) R.Br.	greater twayblade	IV		+				
Lunaria	annua L.	annual honesty	III						
Lunaria	rediviva L.	perennial honesty	II	EN	+				

Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat Directive A-IV	IUCN Red List 2013
Luzula	campestris (L.) DC.	field wood-rush	IV		+				
Luzula	multiflora (Ehrh.) Lej.	common woodrush			+				
Melampyrum	argyrocomum (Fisch. ex Ledeb.) K.-Pol.	?			+				
Neottia	nidus-avis (L.) Rich.	Bird's-nest Orchid	VIII		+				
Nectaroscordum	bulgaricum Janka	Mediterranean bells	III	EN	+			+	
Orchis	mascula (L.) L. ssp signifera (Vest) Soo	early-purple orchid	II		+				
Orchis	palustris Jacq.	bog orchid	II	EN	+				
Orchis	purpurea Huds.	lady orchid	II	EN	+				
Ornithogalum	flavescens Lam.		IV		+				
Padus	avium Mill.		III-IV	EN	+				
Paris	quadrifolia L.	True Lover's Knot	II		+				
Petasites	hybridus (L.) Gaertn., Mey. et Scherb.	butterbur	II		+				
Platanthera	bifolia (L.) Rich.	butterfly-orchid	II						
Platanthera	chlorantha (Cust.) Reichenb.	greater butterfly-orchid	II		+				
Polypodium	vulgare L.	common polypody	IV		+				
Polystichum	aculeatum (L.) Roth	Hard Shield Fern	II	EN	+				
Potentilla	micrantha Ramond ex DC.	?			+				
Ranunculus	polyphyllus Waldst. et Kit. ex Willd.				+				
Rochelia	retorta (Pall.) Lipsky				+				
Scopolia	carniolica Jacq.	European scopolia	IV	VU	+				
Scorzonera	purpurea L.	red black salsify	VIII		+				

Genus	Species	Common Name	Law on Protected Areas *	Moldova Red Data Book 2001	NEN Operational List	Bern Convention	Habitat Directive A-II	Habitat Directive A-IV	IUCN Red List 2013
Scrophularia	umbrosa Dumort.	green figwort	IV		+				
Scrophularia	vernalis L.	yellow figwort	IV		+				
Securigera	elegans (Panc.) Lassen	crownvetch	IV	VU	+				
Sorbus	domestica L.	service tree	IV	EN	+				
Sorbus	torminalis (L.) Crantz	wild service tree	VIII		+				
Staphylea	pinnata L.	(European) bladdernut	IV		+				
Thalictrum	lucidum L.	shining meadow-rue			+				
Thelypteris	palustris Schott	marsh fern	III-IV	EN	+				
Trommsdorffia	maculata (L.) Bernh.				+				
Tulipa	biebersteiniana Schult. et Schult.fil.		IV		+				
Typha	laxmannii Lepech.	Graceful Cattail	IV		+				
Viola	collina Bess.	Hill violet			+				
Viola	montana L.				+				

\* Only the species with a protection status between I and IV are considered, unless under protection of other instruments

## **16.2 Questionnaires used in the socio-economic survey**

### 16.2.1 Questionnaire for the inhabitants (blank)

## Chestionar – Studiu Socio-Economic

### Introducere:

Un studiu de fezabilitate a fost inițiat pentru a determina costul și impactul privind construcția conductei de gaz natural pe traseul Ungheni-Chisinau, la solicitarea Guvernului al Republicii Moldova. Studiul socio-economic, este o parte a studiului de fezabilitate, care va determina caracteristicile socio-economice ale zonei implicate în proiect și opiniile persoanelor, cu scopul de a identifica potențialul impact social ca urmare a construcției conductei de gaz. Contribuția dumneavoastră ne va ajuta să evaluăm impactul social potențial și dezvoltarea ulterioară a unor măsuri de atenuare.

GOSPODARIA Nr: .....	DATA: .....
DENUMIREA LOCALITĂȚII: .....	
NUMELE RESPONDENTULUI: .....	
VÂRSTA: .....	
SEX: 1. Masculin 2. Femenin	

1 ( )	Chestionarul este realizat de către capul gospodăriei
2 ( )	Chestionarul este realizat de către un membru apropiat al familiei

Gradul de rudenie cu capul gospodăriei

### A. CARACTERISTICILE GOSPODĂRIEI

A1. Gradul de rudenie cu capul gospodăriei	A2. Starea civilă	A3. Gradul de alfabetizare	A4. Instituția de învățământ în care membrul familiei își face studiile sau ultima absolvită.
1. Capul gospodăriei			
2. Soț/Soție	1. Celibatar	1. Analftabet/ă	1. Nu a absolvit nici o instituție
3. Fiu	2. Căsătorit/ă	2. Alfabet/ă	2. Elev în clasele primare
4. Fiică	3. Divorțat/ă		3. A absolvit clasele primare
5. Fiu/Fiică vitreg/ă	4. Văduvit/ă		4. Elev în clasele gimnaziale
6. Nepot	5. Separat/ă		5. A absolvit clasele gimnaziale
7. Părinte			6. Elev în clasele liceale
8. Frate/Soră	6. Necunoscut		7. A absolvit clasele liceale
9. Bunel/Bunică			8. Elev la colegiu
10. Altul (Specificați)			9. Absolvent al colegiului
11. Necunoscut			10. Student/ă
			11. Absolvent al unei instituții de studii superioare
			12. Student la Masterat
			13. Absolvent - Masterat
			14. Student la Doctorat
			15. Absolvent - Doctorat
			16. Necunoscut

	<b>A5. Cu ce se ocupă membrii gospodăriei</b>  1. Fermier 2. Crescător de animale 3. Pensionat 4. Meșteșugar 5. Comerciant/Vân- zător 6. Funcționar public 7. Muncitor 8. Profesor/Învăță -tor 9. Medic/Doctor	<b>A6. Pentru cine el/ea muncește?</b>  1. Afacere proprie (I se revine toată cota parte a profiturilor)  2. Afacere de familie  3. Afacere de familie (neplătit) 4. Întreprindere mică (mai puțin de 10 angajați)  5. Întreprindere medie/mare (Mai mult de 10 angajați, specificați industria)  6. Funcționar public
<b>Caracteristicile gospodăriei (Limbile vorbite - migrare)</b>		
<b>A7. Membrii familiei vorbesc, înțeleg sau scriu în altă limbă decât cea de stat?</b>		
<b>A8. De cât timp locuiți în teritoriu ca gospodărie/familie? (ani)</b>		
<b>A9. De ce va-ți mutat aici? (Alegeți cea mai relevantă variantă)</b>		
<b>B1. Care sunt sursele principale de venit ale familiei?</b> (citiți toate opțiunile). 1 important, 2 mai puțin important, 3 puțin important, 0 nesemnificativ		
<b>B. Venituri, Cheltuieli și Economii</b>		
		<b>Importanța</b>
1. Salariu		
2. Agricultură		
4. Comercializarea lemnului sau a produselor rezultate		
6. Comerț		
7. Venit din arendă		
8. Ajutorul rudelor		
9. Pensie		
10. Indemnizații (Specificați care)		
15. Alta (specificați)		
<b>B2. Care este venitul mediu anual al gospodăriei?</b>		
<b>B3. Cât cheltuiți lunar pentru alimente / băuturi? (MDL)</b>		
<b>B4. Cât cheltuiți anual pentru încălzire? (MDL)</b>		
<b>B5. Cât cheltuiți lunar pentru energia electrică? (MDL)</b>		
<b>B6. Cât de mult cheltuiți anual pentru servicii medicale/de sănătate? (MDL)</b>		
<b>B7. Cât vă costă școlarizarea anuală a copiilor, dacă există? (MDL)</b>		
<b>B8. Cât economisiți anual? (MDL)</b>		
(Dacă persoana interviuată nu face economii, introduceți zero și mergeți către secția C)		
<b>B9. Cum investiți economiile Dvs? (vă rugăm să bifați cât mai relevant)</b>		
1. Procurarea valutei străine		
2. Procurarea aurului		

3. Plasarea la instituțiile bancare	
4. Procurarea valorilor mobiliare	
5. Alta (specificați)	

### C. Locuință si Infrastructura

<b>C1. Care este regimul de proprietate a casei Dvs?</b>	
<b>C2. Care este materialul principal de construcție?</b>	
<b>C3. Care este sursa de apă potabilă în casa dvs.? (bifați)</b>	
- Sanitar în interiorul casei (baie, bucatarie, closet (wc))	
- Pompa de apa	
- Apă din sondă	
- Fântână de la sat	
- Rezervor cu apă	
- Apă de la robinet interior (un robinet)	
- Sistem de alimentare cu apă interior (mai multe robinete)	
- Instalație în afara locuinței	
- Alta (specificați)	
<b>C4. Aveți careva probleme cu alimentarea cu apă? Care sunt problemele cu alimentarea cu apă? (Bifați cele mai relevante elemente. Poate fi mai mult de unul)</b>	
1) Sistarea aprovizionării. Cât de des?	
2) Prezența impurităților	
3) Costul ridicat	
4) Dificil de accesat	
5) Calitate joasă (prezintă duritate)	
6) Alta (precizați)	
<b>C5. Folosiți apa potabila pentru băut?</b>	
<b>1. Da 2. Nu (vă rugăm să specificați sursa de apă potabilă).</b>	
<b>C6. Ce tip de facilitate de salubritate aveți? 1. Closet (WC interior/exterior cu WC rezervor incastat) 2. Latrina (WC exterior fără rezervor incastat)</b>	
<b>C7. Ce tip de sistem de eliminare a apelor uzate aveți în casa Dvs?</b>	
1) Canalizare comună	
2) Hazna septica, eliminată în mod regulat de municipalitate	
3) Hazna septica, eliminate în mod regulat de către proprietar	
4) Evacuată direct în râu/pământ	
5) Latrina	
6) Necunoscut	
<b>C8. Care este metoda de colectare și eliminare a deșeurilor solide?</b>	
1) Colectarea regulata de către autoritățile municipale responsabile	
2) Deversarea <sup>1</sup> pe o groapă de gunoi prestabilită	
3) Deversarea pe o zonă salbatică prestabilită	
4) Deversarea neregulată	
5) Deversarea în râu/lac	
6) Ardere	
7) Alta	
8) Necunoscut	
<b>C9. Aveți probleme cu alimentarea cu energie electrică? 1. Da 2. Nu</b>	
<b>C10. Ce fel de probleme aveți? (Bifați după caz, s-ar putea bifa mai mult de 1 element)</b>	
1 Sistări ale energiei electrice. Frecvența?	
2 Tensiune slabă	
3 Tensiune schimbătoare (flotantă)	
4 Alta. Specificați.	

<sup>1</sup>Deversarea — procesul de scurgere a reziduurilor într-o apă naturală.

### D. EDUCAȚIA

<b>D1. Aveți copii între 6-15 ani? 1. Da (câți) / 2. Nu</b>	
<b>D2. Toti dintre ei frecventează școala? 1. Da, 2. Nu (mentionati câți si sexul</b>	



#### D. EDUCAȚIA

D1. Aveți copii între 6-15 ani? 1. Da (câți) / 2. Nu	
D2. Toți dintre ei frecventează școala? 1. Da, 2. Nu (menționați câți și sexul acestora)	
D3. De ce cineva dintre copiii Dvs. nu merg la școală?	
D4. Sunteți mulțumit de aceste unități de învățământ, de facilitățile oferite? Ați întâlnit probleme? Explicați.	

#### E. SĂNĂTATE

E1. Sunteți mulțumit de institutia medicala/facilitățile de sănătate din regiune?	
---	--

#### F. PERCEPȚII ȘI AȘTEPTĂRI

F1. Cum a fost starea veniturilor, nivelul de trai 5 ani în urmă? 1. Mai bine; 2. Aceeasi; 3. Mai rau	
F2. Care ar fi motivele?	
F3. Cum aflați știrile/noutățile locale? Vă rugăm să selectați 5 cele mai importante surse de informare indicate mai jos.	

1. Posturile de televiziune locale		7. Internet	
2. Posturile de televiziune naționale		8. Postere	
3. Posturile radio locale		9. Broșuri	
4. Posturile radio naționale		10. Adunări locale	
5. Presa locală		11. Profesori/Învățători	
6. Presa națională		12. Vecini/Prieteni	
13. Alta (specificați)			

#### F4. Cum aflați despre proiectele din zona? Vă rugăm să precizați cele mai importante 5 canale în ordine.

1. Posturile locale de televiziune	
2. Posturile de televiziune naționale	
3. Posturile radio locale	
4. Posturile radio naționale	
5. Presa locală	
6. Presa națională	
7. Internet	
8. Postere	
9. Broșuri	
10. Adunări locale	
11. Profesori/Învățători	
12. Vecini/Prieteni	
13. Alta - (specificați)	

## G. UTILIZAREA TERENURILOR ȘI AGRICULTURA

Terenuri si culturile									
G1.	G2.	G3.	G4.	G5.	G6.	G7.	G8.	G9.	G10.
Nr de parcele	Statutul de proprietate	Este terenul irigat?	Mărimea parcelei (ha)	Ce cultivați pe acest teren?	Cine cultivează terenul?	Care este starea titlului de proprietate al acestui teren?	Cum utilizați produsele?	Care este valoarea aproximativă a roadei (MDL,t)?	Va fi acest teren afectat de proiect?
	1. Dețin și cultiv acest teren	1. Da				1. Cu titlu de proprietate	1. Pentru subzistență		1. Da
	2. Dețin dar nu cultiv acest teren	2. Nu				2. Fără titlu de proprietate	2. Comercializare pe piața locală		2. Nu
	3. Utilizez acest teren în arendă	3. Necunoscut				3. Uzual, ordinar	3. Comercializare în afara pieții locale		

**G11. În cazul în care proiectul v-ar afecta terenul, ați prefera compensație în natură sau numerar pentru potențialele daune provocate terenului din cadrul proiectului?**

1. în natură (teren în schimbul terenului afectat); 2. numerar;  
3. nu știu

**G12. Există alți oameni care au drepturi legale recunoscute pe teren (de exemplu, titulari de acorduri, chiriasi etc.)?**

**G13. Aveți vreo doleanță cu privire la potențiala achiziție a terenului? Dacă este așa, le veți comunica?**

**G14. Femeile din familia Dvs au în proprietate/moștenire teren?**

1. În cazul în care, da, pot vinde terenurile, pot să decidă cum să-l folosească?

2. Dacă nu, nu se vor confrunța cu deciziile privind utilizarea terenurilor? Dacă da, cum?

**G15. Ce a evoluat producția agricolă în ultimii 5 ani? 1. A crescut 2. S-a micșorat 3. Nu s-a schimbat**

**G16. De ce a crescut producția agricolă? (vă rugăm să bifați cel mai relevant element)**

1. Îmbunătățirea calității semințelor

2. A crescut gradul de utilizare a îngrășămintelor chimice și pesticidelor

3. A crescut gradul de utilizare a îngrășămintelor organice

4. S-a îmbunătățit sistemul de irigare

5. Am procurat vehicule cu destinație agricolă

6. Alta, specificați.

## 16.2.2 Questionnaire for the inhabitants (filled in example)

### Chestionar – Studiu Socio-Economic

#### Introducere:

Un studiu de fezabilitate a fost inițiat pentru a determina costul și impactul privind construcția conductei de gaz natural pe traseul Ungheni-Chisinau, la solicitarea Guvernului al Republicii Moldova. Studiul socio-economic, este o parte a studiului de fezabilitate, care va determina caracteristicile socio-economice ale zonei implicate în proiect și opiniile persoanelor, cu scopul de a identifica potențialul impact social ca urmare a construcției conductei de gaz. Contribuția dumneavoastră ne va ajuta să evaluăm impactul social potențial și dezvoltarea ulterioară a unor măsuri de atenuare.

GOSPODARIA Nr:.....	DATA:.....
DENUMIREA LOCALITĂȚII: <i>Moghereș</i>	
NUMELE RESPONDENTULUI: .....	
VÂRSTA: .....	
SEX: 1. Masculin 2. <u>Femenin</u>	

1 ( )	Chestionarul este realizat de către capul gospodăriei
2 ( )	Chestionarul este realizat de către un membru apropiat al familiei

Gradul de rudenie cu capul gospodăriei

A1. Gradul de rudenie cu capul gospodăriei	A2. Starea civilă	A3. Gradul de alfabetizare	A4. Instituția de învățământ în care membrul familiei își face studiile sau ultima absolvită.
1. <u>Capul gospodăriei</u>	1. Celbatar	1. Analphabet/ă	1. Nu a absolvit nici o instituție
2. Soț/Soție	2. <u>Căsătorit/ă</u>	2. <u>Alfabet/ă</u>	2. Elev în clasele primare
3. Fiul	3. Divorțat/ă		3. A absolvit clasele primare
4. Fiică	4. Văduvit/ă		4. Elev în clasele gimnaziale
5. Fiul/Fiică vitreg/ă	5. Separat/ă		5. A absolvit clasele gimnaziale
6. Nepot	6. Necunoscut		6. Elev în clasele liceale
7. Părinte			7. A absolvit clasele liceale
8. Frate/Soră			8. Elev la colegiu
9. Bunel/Bunică			9. Absolvent al colegiului
10. Altul (Specificați)			10. Student/ă
11. Necunoscut			11. Absolvent al unei instituții de studii superioare
			12. Student la Masterat
			13. Absolvent - Masterat
			14. Student la Doctorat
			15. Absolvent - Doctorat
			16. Necunoscut <i>Moldova</i>

<b>A5. Cu ce se ocupă membrii gospodăriei</b>	<b>A6. Pentru cine el/ea muncește?</b>
1. Fermier 2. Crescător de animale 3. Pensionat 4. Meșteșugar 5. Comerciant/Vân-zător 6. <u>Funcționar public</u> 7. Muncitor 8. Profesor/Învăță-tor 9. Medic/Doctor	1. Afacere proprie (î se revine toată cota parte a profiturilor) 2. Afacere de familie 3. Afacere de familie (neplătit) 4. Întreprindere mică (mai puțin de 10 angajați) 5. Întreprindere medie/mare (Mai mult de 10 angajați, specificați industria) 6. Funcționar public

<b>A7. Membrii familiei vorbesc, înțeleg sau scriu în altă limbă decât cea de stat?</b>	<u>Ag, F2</u>
<b>A8. De cât timp locuiți în teritoriul ca gospodărie/familie? (ani)</b>	<u>231</u>
<b>A9. De ce va-ți mutat aici? (Alegeți cea mai relevantă variantă)</b>	

<b>B1. Care sunt sursele principale de venit ale familiei?</b> (citiți toate opțiunile). 1 important, 2 mai puțin important, 3 puțin important, 0 nesemnificativ
---

B. Venituri, Cheltuieli și Economii	
	Importanța
1. Salariu	<u>1</u>
2. Agricultură	
4. Comercializarea lemnului sau a produselor rezultate	
6. Comerț	
7. Venit din arendă	
8. Ajutorul rudelor	
9. Pensie	
10. Indemnizații (Specificați care)	
15. Alta (specificați)	

<b>B2. Care este venitul mediu anual al gospodăriei?</b>	<u>40000</u>
<b>B3. Cât cheltuiți lunar pentru alimente / băuturi? (MDL)</b>	<u>2000</u>
<b>B4. Cât cheltuiți anual pentru încălzire? (MDL)</b>	<u>40000</u>
<b>B5. Cât cheltuiți lunar pentru energia electrică? (MDL)</b>	<u>250</u>
<b>B6. Cât de mult cheltuiți anual pentru servicii medicale/de sănătate? (MDL)</b>	<u>0</u>
<b>B7. Cât vă costă școlarizarea anuală a copiilor, dacă există? (MDL)</b>	<u>2</u>
<b>B8. Cât economisiți anual? (MDL)</b>	
(Dacă persoana interviuată nu face economii, introduceți zero și mergeți către secția C)	
<b>B9. Cum investiți economiile Dvs? (vă rugăm să bifați cât mai relevant)</b>	
1. Procurarea valutei străine	

2. Procurarea aurului	
3. Plasarea la instituțiile bancare	
4. Procurarea valorilor mobiliare	
5. Alta (specificați)	

C. Locuință și infrastructura	
C1. Care este regimul de proprietate a casei Dvs?	
C2. Care este materialul principal de construcție?	prop 2. pietra
C3. Care este sursa de apă potabilă în casa dvs.? (bifați)	
- Sanitar în interiorul casei (baie, bucatarie, closet (wc))	
- Pompa de apă	
- Apă din sondă	
<input checked="" type="checkbox"/> Dătină de la sat	
- Rezervor cu apă	
- Apă de la robinet interior (un robinet)	
- Sistem de alimentare cu apă interior (mai multe robinete)	
- Instalație în afara locuinței	
- Alta (specificați)	
C4. Aveți careva probleme cu alimentarea cu apă? Care sunt problemele cu alimentarea cu apă? (Bifați cele mai relevante elemente. Poate fi mai mult de unul)	2
1) Sistarea aprovizionării. Cât de des?	
2) Prezența impurităților	
3) Costul ridicat	
4) Dificil de accesat	
5) Calitate joasă (prezintă duritate)	
6) Alta (precizați)	
C5. Folosiți apa potabilă pentru băut?	
<input checked="" type="checkbox"/> Da <input type="checkbox"/> Nu (vă rugăm să specificați sursa de apă potabilă).	
C6. Ce tip de facilități de salubritate aveți? 1. Closet (WC interior/exterior cu WC rezervor încastat) 2. Latrina (WC exterior fără rezervor încastat)	2
C7. Ce tip de sistem de eliminare a apelor uzate aveți în casa Dvs?	
1) Canalizare comună	
2) Hazna septica, eliminată în mod regulat de municipalitate	
3) Hazna septica, eliminate în mod regulat de către proprietar	
4) Evacuată direct în râu/pământ	
5) Latrina	
6) Necunoscut	
C8. Care este metoda de colectare și eliminare a deșeurilor solide?	
1) Colectarea regulată de către autoritățile municipale responsabile	✓ (pers fiz)
2) Deversarea <sup>1</sup> pe o groapă de gunoi prestabilită	
3) Deversarea pe o zonă salbatică prestabilită	
4) Deversarea neregulată	
5) Deversarea în râu/lac	
6) Ardere	
7) Alta	
8) Necunoscut	
C9. Aveți probleme cu alimentarea cu energie electrică? 1. Da <input checked="" type="checkbox"/> Nu	
C10. Ce fel de probleme aveți? (Bifați după caz, s-ar putea bifa mai mult de 1 element)	

<sup>1</sup> Deversarea – procesul de scurgere a reziduurilor într-o apă naturală.

1 Sistări ale energiei electrice. Frecvența?	
2 Tensiune slabă	
3 Tensiune schimbătoare (flotantă)	
4 Alta. Specificați.	

D1. Aveți copii între 6-15 ani? 1. <u>Da</u> (câți) / 2. Nu	
D2. Toți dintre ei frecventează școala? 1. <u>Da</u> / 2. Nu (menționați câți și sexul acestora)	
D3. De ce cineva dintre copiii Dvs. nu merg la școală?	
D4. Sunteți mulțumit de aceste unități de învățământ, de facilitățile oferite? Ați întâlnit probleme? Explicați.	

E1. Sunteți mulțumit de institutia medicala/facilitățile de sănătate din regiune?	<u>Da</u>
---	-----------

F1. Cum a fost starea veniturilor, nivelul de trai 5 ani în urmă?	
1. <u>Mai bine</u> / 2. Aceeasi; 3. Mai rau	
F2. Care ar fi motivele?	
F3. Cum aflați știrile/noutățile locale? Vă rugăm să selectați 5 cele mai importante surse de informare indicate mai jos.	

1. Posturile de televiziune locale		7. Internet	<u>✓</u>
2. Posturile de televiziune naționale	<u>✓</u>	8. Postere	
3. Posturile radio locale		9. Broșuri	
4. Posturile radio naționale		10. Adunări locale	
5. Presa locală		11. Profesori/învățători	
6. Presa națională		12. Vecini/Prieteni	
13. Alta (specificați)			

F4. Cum aflați despre proiectele din zona? Vă rugăm să precizați cele mai importante 5 canale în ordine.	
1. Posturile locale de televiziune	<u>✓</u>
2. Posturile de televiziune naționale	
3. Posturile radio locale	
4. Posturile radio naționale	
5. Presa locală	
6. Presa națională	<u>✓</u>
7. Internet	
8. Postere	
9. Broșuri	
10. Adunări locale	
11. Profesori/învățători	
12. Vecini/Prieteni	<u>✓</u>
13. Alta - (specificați)	

7

### Terenuri si culturile

G1.	G2.	G3.	G4.	G5.	G6.	G7.	G8.	G9.	G10.
Nr de parcele	Statutul de proprietate	Este terenul irigat?	Mărimea parcelei (ha)	Ce cultivați pe acest teren?	Cine cultivează terenul?	Care este starea titlului de proprietate al acestui teren?	Cum utilizați produsele?	Care este valoarea aproximativă a roadei (MDL, U)?	Va fi acest teren afectat de proiect?
	1. Dețin și cultiv acest teren	1. Da				1. Cu titlu de proprietate	1. Pentru subzistență		1. Da
	2. Dețin dar nu cultiv acest teren	2. Nu				2. Fără titlu de proprietate	2. Comercializate pe piața locală		2. Nu
	3. Utilizez acest teren în arendă	3. Necunoscut				3. Uzual, ordinar	3. Comercializate în afara pieței locale		

G11. În cazul în care proiectul v-ar afecta terenul, ați prefera compensație în natură sau numerar pentru potențialele daune provocate terenului din cadrul proiectului?  
1. În natură (teren în schimbul terenului afectat); 2. numerar; 3. nu știu

G12. Există alți oameni care au drepturi legale recunoscute pe teren (de exemplu, titulari de acorduri, chiriași etc.)?

G13. Aveți vreo doleanță cu privire la potențiala achiziție a terenului? Dacă este așa, le veți comunica?

G14. Femeile din familia Dvs au în proprietate/moștenire teren?  
1. În cazul în care, da, pot vinde terenurile, pot să decidă cum să-l folosească?  
2. Dacă nu, nu se vor confrunta cu deciziile privind utilizarea terenurilor? Dacă da, cum?

G15. Ce a evoluat producția agricolă în ultimii 5 ani? 1. A crescut 2. S-a micșorat 3. Nu s-a schimbat

G16. De ce a crescut producția agricolă? (vă rugăm să bifați cel mai relevant element)

1. Îmbunătățirea calității semințelor

2. A crescut gradul de utilizare a îngrășămintelor chimice și pesticidelor

3. A crescut gradul de utilizare a îngrășămintelor organice

4. S-a îmbunătățit sistemul de irigare

5. Am procurat vehicule cu destinație agricolă

6. Alta, specificați.

### 16.2.3 Questionnaire for the mayors (blank)

#### ÎNTREBĂRI ORIENTATIVE PENTRU INTERVIEWAREA PRIMARULUI SATULUI

<b>Chestionar Nr:</b>	
<b>Data:</b>	
<b>Numele intervievatorului:</b>	
<b>Numele intervievatului:</b>	
<b>Chestionarul a fost adresat primarului satului</b>	
<b>Chestionarul a fost adresat altei persoane importante</b>	
<b>Specificați adresa:</b>	
<b>Numărul de tel:</b>	
<b>Denumirea localității:</b>	
<b>Denumirea raionului:</b>	
<b>1. PROFILUL ISTORIC</b>	
1. Când a fost înființat acest sat?	
<b>2. DEMOGRAFIA/PROFILUL GENERAL</b>	
2. Câți oameni sunt în sat? Câte gospodării sunt prezente?	
3. Câte grupuri etnice sunt în acest sat? Care sunt principalele/etniile majoritare? Care sunt diferențele culturale?	
4. Ce limbi sunt vorbite în comunitatea Dvs.?	
5. Care este principala religie în comunitatea Dvs.? Mai sunt și alte religii?	
6. Populația satului a crescut sau a scăzut în ultimii 10 ani? De ce?	
7. A existat migrația în zona? În cazul în care da, care este motivul ca acești oameni vin/pleacă? Care au fost efectele pozitive ale migrației? Care au fost efectele negative ale migrației? A existat vreun conflict între rezidenți și migranți?	
<b>3. CONDUCEREA/ADMINISTRAȚIA</b>	
8. Există grupuri, organizații, asociații și cooperative în sat? Care sunt acestea? (asociații de vânători de exemplu, etc.).	
9. Are raionul dvs un plan de dezvoltare despre care ați auzit/cunoașteți? Ați fost consultat cu privire la aceasta?	
<b>4. ECONOMIA LOCALĂ/NIVELUL DE</b>	



<b>TRAI</b>			
11. Există anumite grupuri specializate în anumite domenii de muncă? Numiți care grupuri și care domenii.			
<b>5. RESURSELE FORESTIERE/PROPRIETATEA</b>			
12. Există vre-o pădure în imediata apropiere a satului Dvs? Oamenii strâng lemn de foc din pădure? Dar produsele forestiere nelemnoase?			
13. Puteți să relatați câteva informații despre producția agricolă? Ce produse agricole se produc? Sunt ferme mici, medii sau mari în general (specificați numărul aproximativ al angajaților, volumul vânzărilor)?			
14. Puteți să relatați câteva informații despre producția industrială? Sunt întreprinderi mici, medii sau mari (specificați numărul aproximativ al angajaților, volumul vânzărilor)?			
15. Oamenii din sat au teren propriu? Este aceasta un acord formal sau informal și cu cine?			
<b>6. INFRASTRUCTURA SOCIO-ECONOMICA</b>			
16. Există vreo una din infrastructurile socio-economice publice sau private în regiunea Dvs. cât de multe?			
17. Infrastructuri socio-economice (Nr)		Daca nu există, la ce distanță (km) este?	Este îndeajuns această structură?
Școala/Liceu			
Spital raional			
Spital local			
Alte facilități (instituții medicale)			
Sector de poliție			
Biblioteca			
Magazine (Market, brutărie, măcelarie etc.)			
Financiare (e.g. bancă, ATM, case de schimb valutar)			
Oficiu Poștal			
Coffee house			

Alta (specificați)			
--------------------	--	--	--

## 16.2.4 Questionnaire for the mayors (filled in example)

Chestionar Nr:	
Data:	11.05.15
Numele Intervievatorului:	
Numele intervievatului:	
1 Chestionarul a fost adresat primarului satului	✓
2 ( ) Chestionarul a fost adresat altei persoane importante	
Specificați adresa:	
Numărul de tel:	
Denumirea localității:	Mvelenseni
Denumirea raionului:	
<b>1. DEMOGRAFIA/PROFILUL GENERAL</b>	
1. Câți oameni sunt în sat? Câte gospodării sunt prezente?	2268, 860
2. Câte grupuri etnice sunt în acest sat? Care sunt principalele/etnile majoritare? Care sunt diferențele culturale?	Mold. (Rus, Ucr)
3. Ce limbi sunt vorbite în comunitatea dvs.?	Ro.
4. Care este principala religie în comunitatea dvs.? Mai sunt și alte religii?	Ortodox.
5. Populația satului a crescut sau a scăzut în ultimii 10 ani? De ce?	Scăzut.
6. A existat migrația în zona? În cazul în care da, care este motivul ca acești oameni vin/pleacă? Care au fost efectele pozitive ale migrației? Care au fost efectele negative ale migrației? A existat vreun conflict între rezidenți și migranți?	Da
<b>2. CONDUCEREA/ADMINISTRAȚIA</b>	
7. Există grupuri, organizații, asociații și cooperative în sat? Care sunt acestea? (asociații de vânători de exemplu, etc.).	Asoc cons de apa; Asoc cons de poștă
8. Are raionul dvs. un plan de dezvoltare despre care ați auzit/cunoașteți? Ați fost consultat cu privire la aceasta?	Da.
<b>3. ECONOMIA LOCALĂ/NIVELUL DE TRAI</b>	

9. Care sunt principalele locuri de munca pe care oamenii din comunitate le practică?		Agricultura	
10. Există anumite grupuri specializate în anumite domenii de muncă? Numiți care grupuri și care domenii.		Nu	
<b>4. RESURSELE FORESTIERE/PROPRIETATEA</b>			
11. Există vreo pădure în imediata apropiere a satului Dvs.? Oamenii strâng lemn de foc din pădure? Dar produsele forestiere nelemanoase?		Da	
12. Puteți să relați câteva informații despre producția agricolă? Ce produse agricole se produc? Sunt ferme mici, medii sau mari în general (specificați numărul aproximativ al angajaților, volumul vânzărilor)?		Roșeta, Păune	
13. Puteți să relați câteva informații despre producția industrială? Sunt întreprinderi mici, medii sau mari (specificați numărul aproximativ al angajaților, volumul vânzărilor)?		Produs de la Cămin	
14. Oamenii din sat au teren propriu? Este aceasta un acord formal sau informal și cu cine?		Da	
<b>5. INFRASTRUCTURA SOCIO-ECONOMICĂ</b>			
15. Există vreo una din infrastructurile socio-economice publice sau private în regiunea Dvs., cât de multe?			
16. Infrastructuri socio-economice (Nr)		Dacă nu există, la ce distanță (km) este?	Este îndeajuns ac structura?
Școala/Liceu	1		
Spital raional			
Spital local (Dvs.)	1		
Alte facilități (instituții medicale)			
Sector de poliție	1		
Biblioteca	1		
Magazine (Market, brutărie, măcelarie etc.)	12		
Financiare (e.g. bancă, ATM, case de schimb valutar)	—		
Oficiu Poștal	1		
Coffee house			
Alta (specificați)			

7

Întrebări orientative	
1. Cunoaște-ți despre proiectul propus gazoductul Ungheni-Chișinău? Cum ai fost informat? Este ceva despre care ai dori să aflați mai multe informații?	Nu
2. Ce părere aveți despre acest proiect? Credeți că e necesar fie implementat acest proiect? De ce, de ce da/ nu?	Positiv
3. Cum credeți că acest proiect poate afecta oamenii din această zonă, și în special grupul/familia dvs.? Ce credeți că poate fi aplicat ca măsuri de atenuare?	Positiv
4. Doriți să adăugați altceva?	

D

## 16.3 Socio-economic data for the project area

**Table 16-21: Investments in dwelling construction per districts**

District	Million MDL, current prices			Per one inhabitant, MDL		
	2011	2012	2013	2011	2012	2013
Ungheni	2,0	2,3	2,0	16,8	19,9	17,3
Nisporeni	10,7	11,2	9,3	160,7	169,2	139,9
Călărași	3,1	5,2	3,8	39,2	66,0	47,9
Strășeni	15,3	20,5	12,1	167,6	224,0	131,7
Mun. Chișinău	1891,5	1910,0	2065,7	2387,8	2394,4	2573,9

Source: National Bureau of Statistics

**Table 16-22: Production of main industrial products**

District	Sand, thousand t		Gravel, pebbles, boulders and flint, kt	
	2011	2012	2011	2012
Whole country	1286,7	1318,8	2156,4	2013,5
Ungheni	40,9	15,4	0,2	0,3
Nisporeni	-	-	-	-
Călărași	6,5	3,2	-	-
Strășeni	-	-	301,9	467,9
Mun. Chișinău	370,7	471,7	417,2	221,8

Source: National Bureau of Statistics

**Table 16-23: Juices, processed fruits, canned vegetables production**

District	Fruit and vegetable juices, thousand liters		Canned vegetables, tonnes	
	2011	2012	2011	2012
Whole country	29715,3	46055,2	26335,6	24291,1
Ungheni	1445,1	2863,9	685,6	1572,4
Nisporeni	-	-	-	-
Călărași	20,9	476,7	193,5	34,8
Strășeni	-	-	57,3	14,7
Mun. Chișinău	21458,0	33915,5	8997,4	10337,4

Source: National Bureau of Statistics

**Table 16-24: Processed fruits, milk production**

District	Processed and preserved fruit, t		Milk and cream with a fat content of up to 6%, t	
	2011	2012	2011	2012
Ungheni	76,9	83,0	-	-
Nisporeni	-	-	-	-
Călărași	240,4	27,9	-	-
Strășeni	-	-	-	-
Mun. Chișinău	3143,6	3110,8	18463,7	20277,9

Ungheni	76,9	83,0	-	-
---------	------	------	---	---

Source: National Bureau of Statistics

**Table 16-25: Grocery production**

District	Flour, t		Groats, t	
	2011	2012	2011	2012
Whole country	118176,9	100625,0	4842,7	3562,9
Ungheni	4334,1	2879,2	78,0	52,4
Nisporeni	160,8	210,5	-	-
Călărași	119,7	-	-	-
Strășeni	148,1	108,2	-	-
Mun. Chișinău	7193,7	6202,9	1076,5	822,5

Source: National Bureau of Statistics

**Table 16-26: Confectionery, pasta production**

District	Confectionery products ,t		Pasta products, t	
	2011	2012	2011	2012
Ungheni	28,8	44,9	-	-
Nisporeni	1,1	1,5	-	-
Călărași	37,4	34,7	-	-
Strășeni	83,5	99,8	-	-
Mun. Chișinău	36567,3	37331,1	4417,9	3498,8

Source: National Bureau of Statistics

**Table 16-27: Wine production**

District	Sparkling wine, thousand dhal		The natural wine grapes, thousand dhal	
	2011	2012	2011	2012
Whole country	686,4	653,9	12462,7	14830,4
Ungheni	-	-	79,5	118,2
Nisporeni	57,6	32,6	150,2	435,4
Călărași	-	-	747,3	1451,3
Strășeni	-	-	368,8	476,8
Mun. Chișinău	543,5	534,8	3955,4	3738,7

Source: National Bureau of Statistics

**Table 16-28: Centralized water supply systems**

District	Existing water supply systems	Operating water supply systems	including rural areas (operational systems)
	2012	2012	2012
Ungheni	17	15	14
Nisporeni	13	13	12
Călărași	9	9	8
Strășeni	18	10	9
Mun. Chișinău	18	18	14

Source: National Bureau of Statistics

**Table 16-29: Centralized water supply systems**

District	Existing Sewer systems	Sewer systems equipped with wastewater treatment plants	Sewer systems in
	2012	2012	2012
Ungheni	6	6	4
Nisporeni	2	1	-
Călărași	2	1	1
Strășeni	8	6	7
Mun. Chișinău	10	9	4

Source: National Bureau of Statistics

**Table 16-30: Road freight**

District	Transported goods, thousands t	
	2011	2012
Whole country	24896,1	24562,9
Ungheni	243,5	198,5
Nisporeni	293,5	447,1
Călărași	176,9	178,2
Strășeni	450,1	379,4
Mun. Chișinău	8860,7	8966,7

Source: National Bureau of Statistics

**Table 16-31: Transportation**

District	Transported passengers, thousands	
	2011	2012
Whole country	118409,0	120156,2
Ungheni	2312,3	2435,2
Nisporeni	638,1	712,5
Călărași	719,4	778,2
Strășeni	1614,5	1719,5
Mun. Chișinău	73288,1	75611,3

Source: National Bureau of Statistics

**Table 16-32: Road infrastructure**

Data Type	Mun. Chisinau	Calarasi	Straseni	Nisporeni	Ungheni
Road access	All-weather road				
Road Availability	All year				
Main road number	R2, R5, M14	R1; R20; R21, M14	M14	R24	R1



Road surface	Asphalt road	Asphalt road, Paved, dust-controlled gravel, untreated gravel	Asphalt road, Paved, dust-controlled gravel, untreated gravel	Asphalt road, Paved, dust-controlled gravel, untreated gravel	Asphalt road, Paved, dust-controlled gravel, untreated gravel
Ownership of facility	National road (magistral/republican)	National road (magistral/republican)	National road (magistral/republican)	National road (magistral/republican)	National road (magistral/republican)

Source: National Bureau of Statistics

**Table 16-33: Land holder status for districts**

Particulars	No of Households	%
Land Holder Households	100	100
Landless Households	0	0
Total Households	100	100

Source: National Bureau of Statistics

**Table 16-34: Access to school for districts**

Access to school studies	From total number of residents interviewed	%
Yes	100	100
No	0	0
Total	100	100

Source: National Bureau of Statistics

**Table 16-35: Access to road for districts**

Whether connected to Road	Number of Households	%
Yes	100	100
No	0	0
Total	100	100

Source: National Bureau of Statistics

## Ungheni district

**Table 16-36: Demographic profile per gender and age aspect, 2013 (Ungheni district)**

Age Group	Male		Female		Total	
	No. habitants	%	No. habitants	%	No. habitants	%
Children (Below 6 Years)	4245	42	5856	58	10101	8,6
Children (6 – 18 Years)	6554	42	9056	58	15610	13,28
Adult (19 – 65 Years male and 19 – 60 years for female)	33386	42	46098	58	79484	67,72
Pension age (65 Years and Over males and 60 years and over – female)	5123	42	7082	58	12205	10,4
Total	49308	-	68092	-	117400	100

Source: National Bureau of Statistics

**Table 16-37: Ethnicity of Ungheni citizens**

Ethnicity	%
Moldovan	89,94
Russian	2,5
Ukrainian	7
Bulgarian	0,08
Gagauz	0,08
Total	100

Source: National Bureau of Statistics

**Table 16-38: Labour status per gender category, 2013 (Ungheni district)**

Type of Activities	Male		Female	
	No	%	No	%
Active	20139	100	26768	100
Employed	9676	48	13116	49
Unemployed	10463	52	13652	51

Source: National Bureau of Statistics

**Table 16-39: Population access to Electricity, 2013 (Ungheni district)**

Access to electricity	Average number of kw/h per capita	Average Total kw/h
100%	1,19	47600

Source: Elaborated based on data processed from the questionnaires and National Bureau of Statistics

**Table 16-40: Average Annual Household Income against Number of Sources, 2013 (Ungheni district)**

Number of sources of Income	No. habitants	Share (%)	Average Monthly Personal Income (MDL)
Source 1	23034	32,45	2900
Source 2	47949	67,55	
Total	70983	100	

Source: National Bureau of Statistics

**Table 16-41: Residents attending educational institutions, 2015 (Ungheni district)**

Category	Male		Female		Total	
	No	%	No	%	No	%
Pre-School	1102	6,05	1258	5,0	2360	5,46
Primary & Secondary	14955	82,11	20909	83,1	35864	82,68
Vocational education	779	4,28	1082	4,3	1861	4,29
University	1377	7,56	1912	7,6	3289	7,57
Total	18213	-	25161	-	43374	-

Source: National Bureau of Statistics

**Table 16-42: Residents water supply, 2013 (Ungheni district)**

Sources	Quantity ( mln. t)	% from total
Natural wells	14,15	93,64

Water supply networks leakages/losses	0,961	6,36
Total (in region)	15,11	100

Source: National Bureau of Statistics

Table 16-43: Industrial production, 2013 (Ungheni district)

District	Number of Enterprises	Value of production (mln, MDL)	%
Ungheni	108	161,433	4,14
Total per country	5089	39024,3	100,0

Source: National Bureau of Statistics

Table 16-44: Average Monthly Income by Sources, 2013 (Ungheni district)

Sources of Income	Average Monthly Income (MDL)
Agriculture, hunting and forestry	2164,8
Industry	3803,1
Manufacture of textiles	3600,9
Transport and Communications	4146,9
Other community, social and personal services	2870,2
Average	3317,18

Source: National Bureau of Statistics

Table 16-45: Habitants income status evolution during last 5 years (Ungheni dis.)

Better	Worse	The same
8 (26,66 %)	9 (30 %)	5 (16,66 %)

Source: Elaborated based on data gathered from questionnaires

Table 16-46: Main revenue sources, 2013 (Ungheni district)

Revenue sources	Main	Secondary
Salary	18 (60 %)	3 (10 %)
Pension	7 (23,33 %)	3 (10 %)
Compensation	-	1 (3,33 %)
Agriculture	3 (10 %)	5 (16,66 %)
Other	1 (3,33 %)	1 (3,33 %)

Source: Elaborated based on data gathered from questionnaires

Table 16-47: Total Average Annual Expenditure of habitants, 2013 (Ungheni district)

Consumption Pattern	Average Annual Expenditure of residents ( mln. MDL)	% to total expenditure
Food	146,2	33,03
Non – food	296,4	66,97
Total	442,6	100

Source: National Bureau of Statistics

Table 16-48: Major cropping pattern of households, 2014(Ungheni district)

Type of Crops	Average Yield (tonnes)	% from Total
Cereals and leguminous crops	6345	66,83
Sunflower	2408	25,36
Field vegetables	741	7,81

Total	9494	100
-------	------	-----

Source: National Bureau of Statistics

Table 16-49: Average nominal monthly earning per employee, 2013 (Ungheni district)

District	Amount, MDL	In % to the avg Salary in economy
Ungheni	3046,6	82,9
Total country	4336,5	118,0

Source: National Bureau of Statistics

#### Nisporeni district

**Table 16-50: Demographic profile per gender and age aspect, 2013 (Nisporeni district)**

Age Group	Male		Female		Total	
	No.	%	No.	%	No.	%
Children (Below 6 Years)	2295	52	2153	48	4448	6,22
Children (6 – 18 Years)	5431	51	5258	49	10689	14,94
Adult (19 – 65 Years male and 19 – 60 years for female)	22993	47	26117	53	49110	68,63
Pension age (65 Years and Over males and 60 years and over – female)	1964	27	5344	73	7308	10,21
Total	32683	-	38872	-	71555	100

Source: National Bureau of Statistics

Table 16-51: Ethnicity of Nisporeni citizens, 2013

Ethnicity	%
Moldovan	97,52
Russian	1,5
Ukrainian	0,68
Bulgarian	0,1
Roma	0,2
Total	100

Source: National Bureau of Statistics

Table 16-52: Labour status per gender category, 2013 (Nisporeni district)

Type of Activities	Male		Female	
	No	%	No	%
Active	12879	100	13595	100
Employed	6181	48	6662	49
Unemployed	11539	52	6933	51

Source: National Bureau of Statistics

**Table 16-53: Population access to Electricity, 2013 (Nisporeni district)**

Access to electricity	Average number of kw/h per capita	Average Total kw/h
100%	1,19	85150,5

Source: Elaborated based on data processed from the questionnaires and National Bureau of Statistics

Table 16-54: Average annual household income against number of sources, 2013 (Nisporeni district)

Number of sources of Income	No. habitants	Share (%)	Average Personal Income (MDL)
Source 1	6931	32,45	2780
Source 2	14427	67,55	
Total	21358	100	

Source: National Bureau of Statistics

Table 16-55: Residents attending educational institutions, 2015 (Nisporeni district)

Category	Male		Female		Total	
	No	%	No	%	No	%
Pre – School	1066	46	1269	54	2335	18,94
Primary & Secondary	3183	46	3786	54	6969	56,53
Vocational education	289	46	342	54	631	5,12
University	1093	46	1299	54	2392	19,41
Total	5630	-	6697	-	12327	100

Source: National Bureau of Statistics

Table 16-56: Residents water supply, 2013 (Nisporeni district)

Sources	Quantity (t)	% from total
Natural wells	16,88	93,6
Water supply networks leakages/losses	1,15	6,4
Total (in region)	18,03	100

Source: National Bureau of Statistics

Table 16-57: Industrial production, 2013 (Nisporeni district)

District	Number of enterprises	Value of production (mln, MDL)	%
Nisporeni	63	133,7	3,43
Total country	5089	39024,3	100,0

Source: National Bureau of Statistics

Table 16-58: Average monthly income by sources, 2013 (Nisporeni district)

Sources of Income	Average Monthly Income (MDL)
Agriculture, hunting and forestry	2421,6
Industry	3965,9
Manufacture of textiles	3600,3
Transport and Communications	5516
Other community, social and personal services	4508
Average	4002,36

Source: National Bureau of Statistics

Table 16-59: Habitants income status evolution during last 5 years (Nisporeni district)

Better	Worse	The same
8 (26,66 %)	2 (6,66 %)	1 (3,33 %)

Source: Elaborated based on data gathered from questionnaires

Table 16-60: Main revenue sources, 2013 (Nisporeni district)

Revenue sources	Main	Secondary
Salary	15 (50 %)	-

Pension	5 (16,66 %)	7 (23,33 %)
Compensation	-	3 (10 %)
Agriculture	8 (26,66 %)	6 (20 %)
Other	2 (6,66 %)	6 (20 %)

Source: Elaborated based on data gathered from questionnaires

**Table 16-61: Total Average annual expenditure of habitants, 2013 (Nisporeni district)**

Consumption Pattern	Average Annual Expenditure of residents (mln. MDL)	% to total expenditure
Food	613,3	44,53
Non – food	764,1	55,47
Total	1377,4	100

Source: National Bureau of Statistics

**Table 16-62: Major cropping pattern of households, 2014 (Nisporeni district)**

Type of Crop	Average Yield (tonnes)	% from Total
Cereals and leguminous crops	369	80,92
Sunflower	82	17,98
Field vegetables	5	1,1
Total	456	100

Source: National Bureau of Statistics

Calarasi district

**Table 16-63: Demographic profile per gender and age aspect, 2013 (Calarasi district)**

Age Group	Male		Female		Total	
	No.	%	No.	%	No.	%
Children (Below 6 Years)	2789	53	2495	47	5284	6,73
Children (6 – 18 Years)	6186	52	5929	48	12115	15,44
Adult (19 – 65 Years male and 19 – 60 years for female)	26645	53	23931	47	50576	64,44
Pension age (65 Years and Over males and 60 years and over – female)	3067	29	7440	71	10507	13,39
Total	38687	100	39795	100	78482	100

Source: National Bureau of Statistics

**Table 16-64: Ethnicity of Calarasi district, 2013**

Ethnicity	%
Moldovan	94,14
Russian	1,26
Ukrainian	3,73
Bulgarian	0,06
Roma	0,5
Total	100

Source: National Bureau of Statistics

**Table 16-65: Labour status per gender category, 2013 (Calarasi district)**

Type of Activities	Male		Female	
	No	%	No	%
Active	32927	100	32682	100
Employed	15805	48	16014	49
Unemployed	17122	52	16668	51

Source: National Bureau of Statistics

**Table 16-66: Population access to Electricity, 2013 (Calarasi district)**

Access to electricity	Average number of kw/h per capita	Average Total kw/h
100%	1,19	85150,5

Source: Elaborated based on data processed from the questionnaires and National Bureau of Statistics

**Table 16-67: Average annual household income against number of sources, 2013 (Calarasi district)**

Number of sources of Income	No. habitants	Share (%)	Average Personal Income (MDL)
Source 1	11880	46,25	3209
Source 2	13807	53,75	
Total	25687	100	

Source: National Bureau of Statistics

**Table 16-68: Residents attending educational institutions, 2015 (Calarasi district)**

Category	Male		Female		Total	
	No	%	No	%	No	%
Pre – School	1125	13,09	1007	12,84	2132	12,97
Primary & Secondary	5986	69,64	5645	71,98	11631	70,76
Vocational education	227	2,64	152	1,94	379	2,3
University	1258	14,63	1038	13,24	2296	13,97
Total	8596	100	7842	100	16438	100

Source: National Bureau of Statistics

**Table 16-69: Residents water supply, 2013 (Calarasi district)**

Sources	Quantity ( mln. t )	% from total
Natural wells	18,52	93,67
Water supply networks leakages/losses	1,25	6,33
Total (in region)	19,77	100

Source: National Bureau of Statistics

**Table 16-70: Industrial production, 2013 (Calarasi district)**

District	Number of Enterprises	Value of production (mln, MDL)	%
Calarasi	72	373,8	9,58
Total country	5089	39024,3	100,0

Source: National Bureau of Statistics

**Table 16-71: Average monthly income by sources, 2013 (Calarasi district)**

Sources of Income	Average Monthly Income (MDL)
Agriculture, hunting and forestry	2421,6
Industry	3965,9
Manufacture of textiles	3600,3
Transport and Communications	5516
Other community, social and personal services	4508
Average	4002,36

Source: National Bureau of Statistics

**Table 16-72: Habitants income status evolution during last 5 years (Calarasi district)**

Better	Worse	The same
6 (21,43 %)	3 (10,71 %)	2 (7,14 %)

Source: Elaborated based on data gathered from questionnaires

**Table 16-73: Main revenue sources, 2013 (Calarasi district)**

Revenue sources	Main	Secondary
Salary	17 (60,71 %)	-
Pension	3 (10,71 %)	6 (21,43 %)
Compensation	-	2 (7,14 %)
Agriculture	8 (28,57 %)	5 (17,86 %)
Other	1 (3,57 %)	9 (32,14 %)

Source: Elaborated based on data gathered from questionnaires

**Table 16-74: Total Average annual expenditure of habitants, 2013 (Calarasi district)**

Consumption Pattern	Average Annual Expenditure of residents (mln. MDL)	% to total expenditure
Food	56,05	44,53
Non – food	69,84	55,47
Total	137,74	100

Source: National Bureau of Statistics

**Table 16-75: Major cropping pattern by households, 2014 (Calarasi district)**

Types of Crop	Average Yield (t)	% from Total
Cereals and leguminous crops	271	69,13
Sunflower	47	11,99
Field vegetables	74	18,88
Total	392	100

Source: National Bureau of Statistics

#### Straseni district

**Table 16-76: Demographic profile per gender and age aspect, 2013 (Straseni district)**



Age Group	Male		Female		Total	
	No.	%	No.	%	No.	%
Children (Below 6 Years)	3570	50	3553	50	7123	7,76
Children (6 – 18 Years)	7524	51	7087	49	14611	15,93
Adult (19 – 65 Years male and 19 – 60 years for female)	30900	51	29065	49	59965	65,36
Pension age (65 Years and Over males and 60 years and over – female)	2900	29	7145	71	10045	10,95
Total	44894	49	46850	51	91744	100

Source: National Bureau of Statistics

**Table 16-77: Ethnicity of Straseni citizens, 2013**

Ethnicity	%
Moldovan	96,92
Russian	1,77
Ukrainian	1,11
Bulgarian	0,12
Gagauz	0,08
Total	100

Source: National Bureau of Statistics

**Table 16-78: Labour status per gender category, 2013 (Straseni district)**

Type of Activities	Male		Female	
	No	%	No	%
Active	35856	100	37358	100
Employed	17211	48	18394	49
Unemployed	18645	52	18964	51

Source: National Bureau of Statistics

**Table 16-79: Population access to Electricity, 2013 (Straseni district)**

Access to electricity	Average number of kw/h per capita	Average Total kw/h
100	1,19	93393,58

Source: Elaborated based on data processed from the questionnaires and National Bureau of Statistics

**Table 16-80: Average annual household income against number of sources, 2013 (Straseni district)**

Number of sources of Income	No. habitants	Share (%)	Average Personal Income (MDL)
Source 1	8114	37,99	2902,7
Source 2	13244	62,01	
Total	21358	100	

Source: National Bureau of Statistics

**Table 16-81: Residents attending educational institutions, 2015 (Straseni district)**

Category	Male		Female		Total	
	No	%	No	%	No	%
Pre – School	40761	46	47639	54	88400	33.52

Primary & Secondary	36614	46	42791	54	79405	30.11
Vocational education	2939	46	3435	54	6 374	2.42
University	41282	46	48247	54	89529	33.95
Total	121596	-	142112	-	263708	100

Source: National Bureau of Statistics

**Table 16-82: Residents water supply, 2013 (Straseni district)**

Sources	Quantity (mln. t)	% from total
Natural wells	20,00	93,67
Water supply networks leakages/losses	1,35	6,33
Total (in region)	21,35	100

Source: National Bureau of Statistics

**Table 16-83: Industrial production, in 2013 (Straseni district)**

District	Number of enterprises	Value of production (mln, MDL)	%
Straseni	98	386,3	9,9
Total country	5089	39024,3	100,0

Source: National Bureau of Statistics

**Table 16-84: Average monthly income by sources, 2013 (Straseni district)**

Sources of Income	Average Monthly Income (MDL)
Agriculture, hunting and forestry	2421,6
Industry	3965,9
Manufacture of textiles	3600,3
Transport and Communications	5516
Other community, social and personal services	4508
Average	4002,36

Source: National Bureau of Statistics

**Table 16-85: Habitants income status evolution during last 5 years (Straseni district)**

Better	Worse	The same
7 (26, 92 %)	3 (11,54 %)	8 (30,77 %)

Source: Elaborated based on data gathered from questionnaires

**Table 16-86: Main revenue sources, 2013 (Straseni district)**

Revenue sources	Main	Secondary
Salary	15 (57,69 %)	1 (3,85 %)
Pension	3 (11,54 %)	1 (3,85 %)
Compensation	-	3 (11,54 %)
Agriculture	1 (3,85 %)	2 (7,69 %)
Other	1 (3,85 %)	1 (3,85)

Source: Elaborated based on data gathered from questionnaires

**Table 16-87: Total Average annual expenditure of habitants, 2013 (Straseni district)**

Consumption Pattern	Average Annual Expenditure of residents (mln. MDL)	% total expenditure
Food	56,05	44,53
Non-food	69,85	55,47
Total	125,90	100

Source: National Bureau of Statistics

**Table 16-88: Major cropping pattern by households, 2014 (Straseni district)**

Type of Crops	Average Yield (t)	% from Total
Cereals and leguminous crops	505	51,01
Sunflower	70	7,07
Field vegetables	415	41,92
Total	990	100

Source: National Bureau of Statistics

Mun. Chisinau

**Table 16-89: Demographic profile per gender and age aspect, 2013 (Mun. Chisinau)**

Age Group	Male		Female		Total	
	No. habitants	%	No. habitants	%	No. habitants	
Children (Below 6 Years)	21198	46	24775	54	45973	5,75
Children (6 – 18 Years)	38510	46	45007	54	83517	10,45
Adult (19 – 65 Years male and 19 – 60 years for female)	265357	46	310130	54	575487	72,01
Pension age (65 Years and Over males and 60 years and over – female)	43434	46	50763	54	94197	11,79
Total	368499	-	430675	-	799174	100

Source: National Bureau of Statistics

**Table 16-90: Ethnicity of Mun. Chisinau citizens, 2013**

Ethnicity	%
Moldovan	72,11
Russian	13,92
Ukrainian	8,28
Bulgarian	1,24
Gagauz	0,91
Jewry	0,37
Polish	0,12
Roma	0,07
Other ethnicities	2,98
Total	100

Source: National Bureau of Statistics

**Table 16-91: Labour status per gender category, 2013 (Mun. Chisinau)**

Type of Activities	Male		Female	
	No	%	No	%
Active	382800	100	338800	100
Employed	367488	96	328626	97
Unemployed	15312	4	10174	3

Source: National Bureau of Statistics

**Table 16-92: Population access to Electricity, 2013 (Mun. Chisinau)**

Access to electricity	Average number of kw/h per capita	Average Total kw/h
100	2,14	1713463

Source: Elaborated based on data processed from the questionnaires and National Bureau of Statistics

**Table 16-93: Average annual household income against number of sources, 2013 (Mun. Chisinau)**

Number of sources of Income	No. habitants	Share (%)	Average Monthly Personal Income (MDL)
Source 1	493090	61,7	4336,5
Source 2	306084	38,3	
Total	799174	100	

Source: National Bureau of Statistics

**Table 16-94: Residents attending educational institutions, 2013 (Mun. Chisinau)**

Category	Male		Female		Total	
	No	%	No	%	No	%
Pre-School	1102	6,05	1258	5,0	2360	11,79
Primary & Secondary	14955	82,11	20909	83,1	35864	27,07
Vocational education	779	4,28	1082	4,3	1861	30,37
University	1377	7,56	1912	7,6	3289	30,75
Total	18213	-	25161	-	43374	-

Source: National Bureau of Statistics

**Table 16-95: Residents water supply, 2013 (Mun. Chisinau)**

Sources	Quantity (mln. t)	% from total
Nistru river	175,8	93,2
Water supply networks leakages/losses	12,81	6,8
Total (in region)	188,61	100

Source: National Bureau of Statistics

**Table 16-96: Industrial production, 2013 (Mun. Chisinau)**

District	Number of Enterprises	Value of production (mln, MDL)	%
Mun. Chisinau	2289	22590,7	57,89
Total country	5089	39024,3	100,0

Source: National Bureau of Statistics

**Table 16-97: Average monthly income by sources, 2013 (Mun. Chisinau)**

Sources of Income	Average Monthly Income Per (MDL)
Agriculture, hunting and forestry	3049,3
Industry	3963,4
Financial activity	7588,4
Transport and Communications	4707,5
Other community, social and personal services	4048,9
Average	4671,5

Source: National Bureau of Statistics

**Table 16-98: Habitants income status evolution during last 5 years (Mun. Chisinau)**

Better	Worse	The same
3(30 %)	4(40 %)	3(30 %)

Source: Data collected from questionnaires

**Table 16-99: Main revenue sources, 2013 (Mun. Chisinau)**

Revenue sources	Main	Secondary
Salary	7 (70 %)	-
Pension	1 (10 %)	2 (20%)
State allowances	-	1 (10 %)
Agriculture	2 (20 %)	1 (10 %)
Other	-	3 (30 %)

Source: Data collected from questionnaires

**Table 16-100: Total Average Annual Expenditure of habitants, 2013 (Mun. Chisinau)**

Consumption Pattern	Average Annual Expenditure of residents (mln. MDL)	% to total expenditure
Food	9121,63	39,6
Non – food	13912,79	60,4
Total	23034,43	100

Source: National Bureau of Statistics

**Table 16-101: Major cropping pattern of households, 2014 (Mun. Chisinau)**

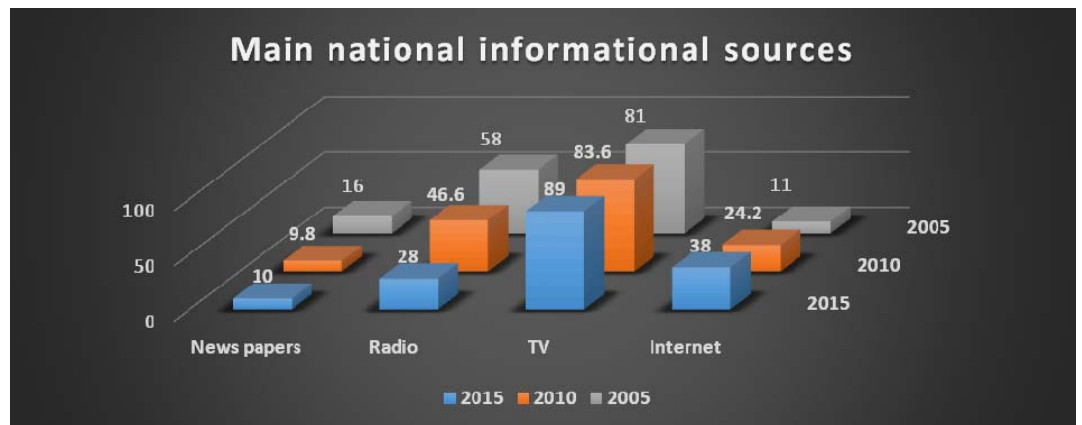
Type of Crops	Average Yield (t)	% from Total
Cereals and leguminous crops	769	72,55
Sunflower	290	27,36
Field vegetables	1	0,9
Total	1060	100

Source: National Bureau of Statistics

**Table 16-102: Main informational sources on national level**

Main informational sources	News papers	Radio	TV	Internet
2005, %	16	58	81	11
2010, %	9,8	46,6	83,6	24,2
2015, %	10	28	89	38

Source: National Bureau of Statistics



**Figure 16-1: How people usually learn about some important news/facts (3.5 mil)**

*Source: National Bureau of Statistics*

## 16.4 Significant cultural, religious and historical sites in/nearby the project area

Table 16-103: Cultural, religious and historical sites in the project area

Name of the site	Location	Significance (rating)	Notes
The church "St. Alexander Nevski "	Ungheni	State	Cultural heritage will be avoided by construction activities
Monument to fallen soldiers of the common grave (566) in 1944	Ungheni	State	
Monument in memory of people who died in 1941-1945	Ungheni	State	
Mosaic. Carpet plant building	Ungheni	Local	
The railway bridge	Ungheni	State	
Monument to fallen soldiers of the common grave (83) 1944 and in memory of the fallen villagers (50) in 1941-1945	Todiresti (Ungheni district)	State	
Monument to fallen soldiers of the common grave (5) 1944 and in memory of the fallen villagers in 1941-1945	Alexeevca (Ungheni district)	State	
Monument in memory of the fallen villagers (23) in 1941-1945	Florițoaia Veche (Ungheni district)	State	
Cellar	Florițoaia Veche (Ungheni district)	State	
Monument in memory of the fallen villagers (114) in 1941-1945	Macaresti (Ungheni district)	State	
Monument to fallen soldiers of the common grave (5) in 1941	Macaresti (Ungheni district)	State	
Monument in memory of the fallen villagers (94) in 1941-1945	Manoilesti (Ungheni district)	State	
Monument to fallen soldiers of the common grave (199) 1944 and in memory of the fallen villagers (144) in 1941-1945	Pirlita (Ungheni district)	State	
Monument in memory of the fallen villagers in 1941-1945	Valea Mare (Ungheni district)	State	
Monument in memory of the fallen villagers (24) in 1941-1945	Zagarancea (Ungheni district)	State	
Monument to fallen soldiers of the common grave (28) 1944 and in memory of the fallen villagers	Nisporeni	Local	
The Church „Sf. Nicolae”	Bolduresti (Nisporeni district)	State	

Name of the site	Location	Significance (rating)	Notes
The Necropolis	Bolduresti (Nisporeni district)	State	
Tumulus-2	Bolduresti (Nisporeni district)	State	
Monument in memory of the fallen villagers in 1941-1945	Bratuleni (Nisporeni district)	Local	
Mansion arboretum of P. Cazimir	Milesti (Nisporeni district)	State	
Monument in memory of the fallen villagers in 1914-1918	Milesti (Nisporeni district)	State	
Monument to fallen soldiers of the common grave 1944 and in memory of the fallen villagers in 1941-1945	Seliște (Nisporeni district)	Local	
Monument in memory of the fallen villagers (40) in 1941-1945	Valea - Trestieni (Nisporeni district)	Local	
Settlement I, II	Calarasi	State	
Monument to fallen soldiers of the common grave (10) in 1944	Calarasi	Local	
The Church „Sf. Paraschivă”	Niscani (Calarasi district)	State	
Sculpture popular, At the cemetery	Pitusca (Calarasi district)	Local	
The Church „Sf. Nicolae”	Sadova (Calarasi district)	State	
Monument to fallen soldiers of the common grave (103) in 1944	Sadova (Calarasi district)	Local	
The Church „Acoperământul Maicii Domnului	Silistea Noua (Calarasi district)	State	
Monument in memory of the fallen villagers in 1941-1945	Silistea Noua (Calarasi district)	Local	
Memorial of military glory at the common grave of fallen soldiers (20) in 1944	Straseni	State	
Monument to fallen soldiers of the common grave (4) 1941	Micleuseni (Straseni district)	Local	
Monument in memory of the fallen villagers in 1941-1945	Dolna (Straseni district)	Local	
Monument to fallen soldiers of the common grave (5) 1944	Dolna (Straseni district)	Local	



Name of the site	Location	Significance (rating)	Notes
Monument of A.S. Puşkin	Dolna (Straseni district)	State	
Monument in memory of the fallen villagers in 1941-1945	Bucovat (Straseni district)	State	
Monument to fallen soldiers of the common grave 1944	Bucovat (Straseni district)	State	
Monument in memory of the fallen villagers in 1941-1945	Capriana (Straseni district)	State	
Monument in memory of the fallen villagers in 1941-1945	Ghelauza (Straseni district)	State	
Monument in memory of the fallen villagers in 1941-1945	Lozova (Straseni district)	State	
Monument in memory of the fallen Partisan in 1941-1945	Lozova (Straseni district)	State	
Monument to fallen soldiers of the common grave 1944	Lozova (Straseni district)	State	
Family mansion G. Ivănuş	Negresti (Straseni district)	State	
Wooden church with 2 stars funeral	Roşcani (Straseni district)	State	
Tumulus	Siret (Straseni district)	State	
Sculpture popular, At the cemetery	Vorniceni (Straseni district)	State	
Sculpture popular, At the cemetery	Gratiesti (Chisinau district)	Local	
Monument in memory of the fallen villagers in 1941-1945	Ghidighici (Chisinau district)	State	
Sculpture popular, At the cemetery	Ghidighici (Chisinau district)	State	
Tumulus-9	Ungheni	State	Further field inspection will be necessary to locate this site. Appropriate protection measures will be implemented, in
Settlement	Pirlita (Ungheni district)	State	
Settlement	Alexeevca (Ungheni district)	State	
Tumulus	Alexeevca (Ungheni district)	State	
Tumulus	Grozasca	State	

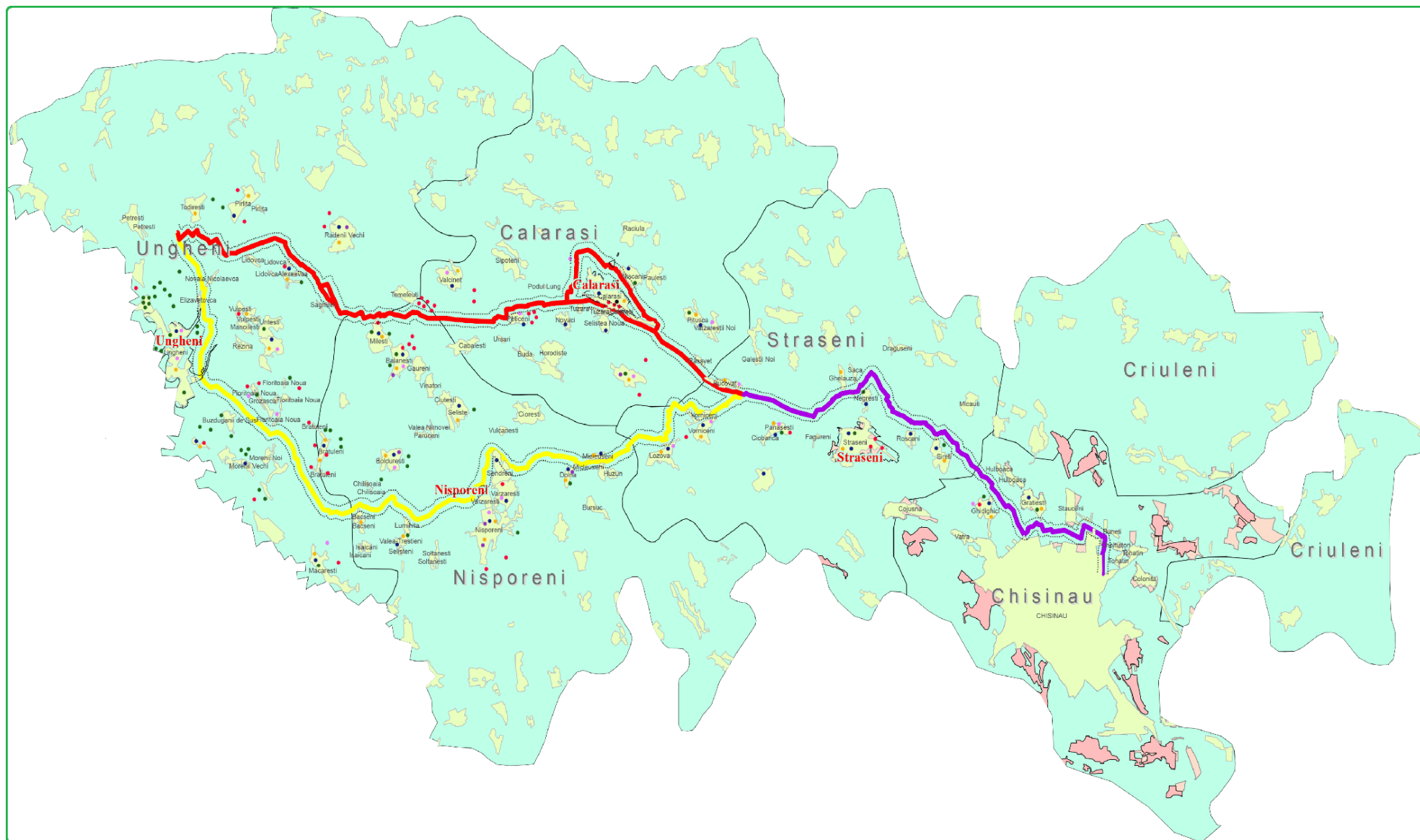
Name of the site	Location	Significance (rating)	Notes
	(Ungheni district)		consultation with local experts.
Tumulus-2	Macaresti (Ungheni district)	State	
Settlement I, II, IV	Manoilesti (Ungheni district)	State	
Tumulus-2	Morenii Noi (Ungheni district)	State	
Tumulus	Untești (Ungheni district)	State	
Settlement	Valea Mare (Ungheni district)	State	
Tumulus-8	Zagarancea (Ungheni district)	State	
Settlement, I	Nisporeni	State	
Tumulus-2	Nisporeni	State	
Settlement I, II, III, V, VI,	Balanesti (Nisporeni district)	State	
The Necropolis	Balanesti (Nisporeni district)	State	
Troita Monument in memory of the fallen villagers 1914-1918	Bolduresti (Nisporeni district)	State	
Tumulus	Valea - Trestieni (Nisporeni district)	State	
Settlement I, II, III, IV, V,	Bratuleni (Nisporeni district)	State	
Tumulus-4	Bratuleni (Nisporeni district)	State	
Wooden Church	Seliște (Nisporeni district)	State	
Tumulus	Seliște (Nisporeni district)	State	
Settlement	Milesti (Nisporeni district)	State	
Settlement necropolis	Milesti (Nisporeni district)	State	
Monument to fallen soldiers of the common grave (4) 1944	Milesti (Nisporeni district)	State	

Name of the site	Location	Significance (rating)	Notes
	district)		
The Church „Sf. Alexandru Nevski”	Calarasi	State	
Stronghold	Valcinet (Calarasi District)	State	
Monument in memory of the fallen villagers in 1941-1945	Valcinet (Calarasi District)	State	
Sculpture popular, At the cemetery	Valcinet (Calarasi District)	Local	
Settlement, I, II, IV	Straseni	State	
Tumulus	Straseni	State	
Settlement, III	Lozova (Straseni district)	State	
Necropolis	Lozova (Straseni district)	State	
The Church „Adormirea Maicii Domnului”	Negresti (Straseni district)	State	
The Church „Sf. Varvara” with wooden belfry	Pănăşeşti (Straseni district)	State	
Residential house of Mary Griva	Pănăşeşti (Straseni district)		
Stronghold	Pănăşeşti (Straseni district)	State	
Monument in memory of the fallen villagers in 1941-1945	Pănăşeşti (Straseni district)	State	
Settlement, I, II, III,	Vorniceni (Straseni district)	State	
The Church „Sf. Apostoli Petru şi Pavel”	Vorniceni (Straseni district)	State	
Settlement	Ghidighici (Chisinau district)	State	
Tumulus-6	Ghidighici (Chisinau district)	State	
Tumulus	Gratiesti (Chisinau district)	State	
The church „Sf. Dumitru”	Floriţoaia Veche (Ungheni district)	State	Further site recording will take place prior to construction. Indirect impacts such
The Church „Sf. Arhanghel Mihail”	Todiresti Veche (Ungheni	State	

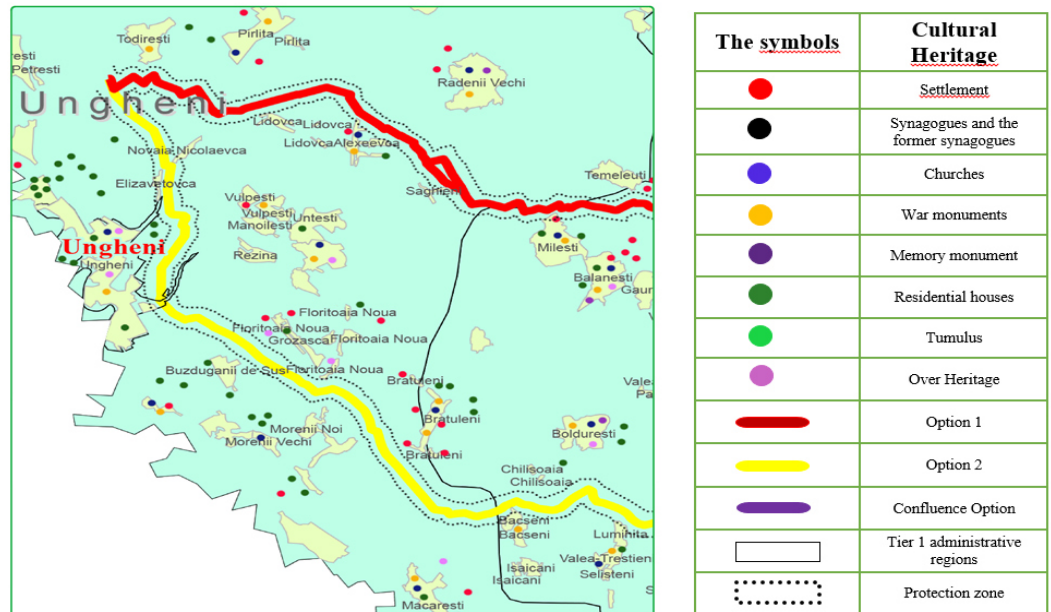
Name of the site	Location	Significance (rating)	Notes
	district)		as vibration will be monitored during construction. Appropriate remediation measures, designed in consultation with local experts, will be implemented if necessary.
Wooden Church „Grigorie Teologul”	Macaresti (Ungheni district)	State	
The Church „Sf. Treime”	Morenii Vechi (Ungheni district)	State	
The Church „Sf. Treime”	Radenii Vechi (Ungheni district)	State	
The Church „Toti Sfintii”	Untesti (Ungheni district)	State	
The Church „Sf. Arhanghel Mihail și Gavriil”	Nisporeni	State	
Monument in memory of the fallen villagers (82) in 1941-1945	Bolduresti (Nisporeni district)	Local	
Settlement	Milesti (Nisporeni district)	State	
The Church „Sf. Gheorghe”	Milesti (Nisporeni district)	State	
Tumulus-2	Milesti (Nisporeni district)	State	
The Church „Sf. Arhanghel Mihail și Gavriil”	Varzaresti (Nisporeni district)	State	
Municipal complex of monasteries „Sf. Dumutru”	Varzaresti (Nisporeni district)	State	
The Church „Adormirea Maicii Domnului”	Valea - Trestieni (Nisporeni district)	State	
The building of the former synagogue	Calarasi	State	
Monument in memory of the fallen villagers in 1941-1945	Calarasi	Local	
Elisei Anastasia House	Niscani (Calarasi district)	State	
The Church „Sf. Gheorghe”	Novaci (Calarasi district)	State	
The Church „Sf. Arhanghel Mihail”	Pitusca (Calarasi district)	State	
Residential house with shop	Pitusca (Calarasi district)	State	
Monument to fallen soldiers of the common grave (94) 1944 and in memory of the fallen villagers in	Pitusca (Calarasi district)	Local	

Name of the site	Location	Significance (rating)	Notes
1941-1945			
Residential house	Sadova (Calarasi district)	State	
Former primary school building	Sadova (Calarasi district)	State	
Monument in memory of the fallen villagers in 1941-1945	Sadova (Calarasi district)	Local	
The Church „Sf. Dumitru”	Peticeni (Calarasi district)	State	
Former primary school building to Zemstvei	Peticeni (Calarasi district)	State	
The building of the former hospital Zemstvei	Peticeni (Calarasi district)	State	
The Church „Sf. Nicolae”	Valcinet (Calarasi district)	State	
The Church „Sf. Cuvioasa Paraschiva”	Straseni	State	
The Church „Sf. Nicolai”	Straseni	State	
The Church “Nașterea Maicii Domnului”	Dolna (Straseni District)	State	
Palli family mansion	Dolna (Straseni District)	State	
The Church „Sf. Treime”	Micleuseni (Straseni District)	State	
Railway station building	Bucovat (Straseni District)	State	
The Church „Sf. Treime”	Capriana (Straseni District)	State	
The monastery "St. Gheorghe "	Capriana (Straseni District)	State	
The Church „Sf. Nicolae”	Lozova (Straseni District)	State	
House of folk architecture G. Dosca	Lozova (Straseni District)	State	
The Church „Sf. Dumitru”	Roșcani (Straseni District)	State	
Wooden church „Sf. Nicolai” with stars funeral	Siret (Straseni District)	State	

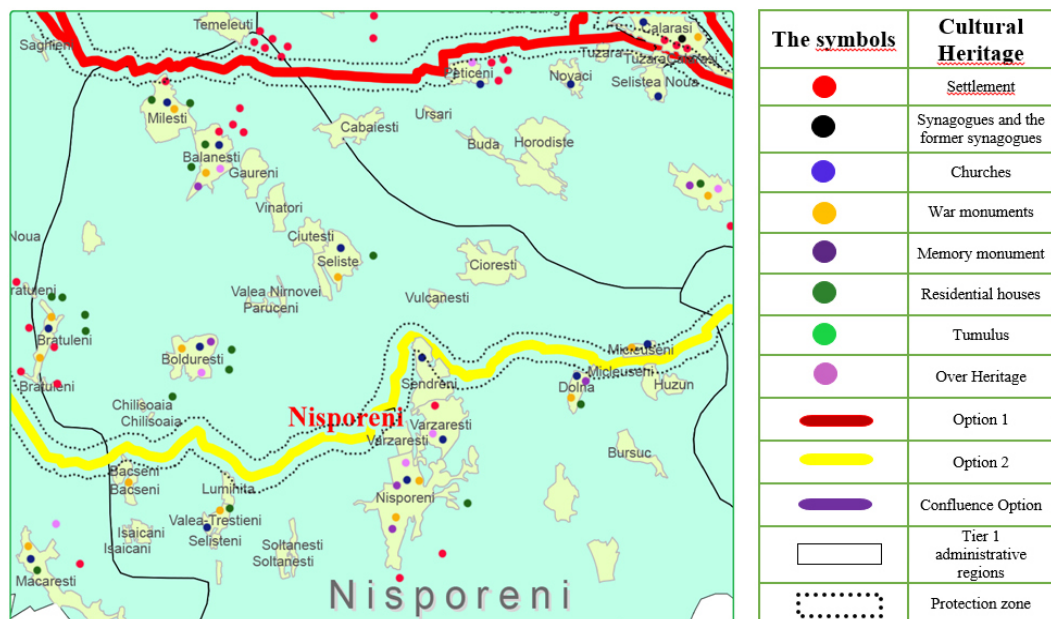
Name of the site	Location	Significance (rating)	Notes
Monument in memory of the fallen villagers in 1941-1945	Siret (Straseni District)	State	
Wooden church „Sf. Arhanghel Mihail și Gavriil”	Vorniceni (Straseni District)	State	
Monument in memory of the fallen villagers in 1941-1945	Vorniceni (Straseni District)	State	
Wooden Church „Sf. Acoperemânt al Maicii Domnului”	Ghidighici (Chisinau district)	State	
Station	Ghidighici (Chisinau district)	State	
The Church „Sf. Treime”	Gratiesti (Chisinau district)	State	



**Figure 16-2: Cultural heritage sites on the pipeline route (Ungheni – Chisinau)**

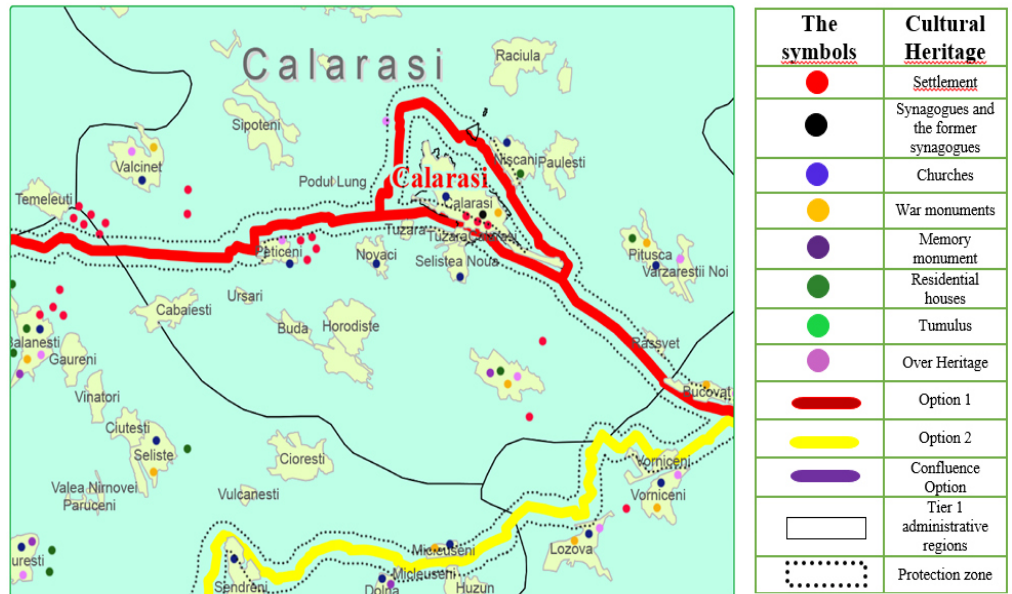


**Figure 16-3: Cultural heritage sites on the potential affected localities (Ungheni district)**



**Figure 16-4: Cultural heritage sites on the potential affected localities (Nisporeni district)**

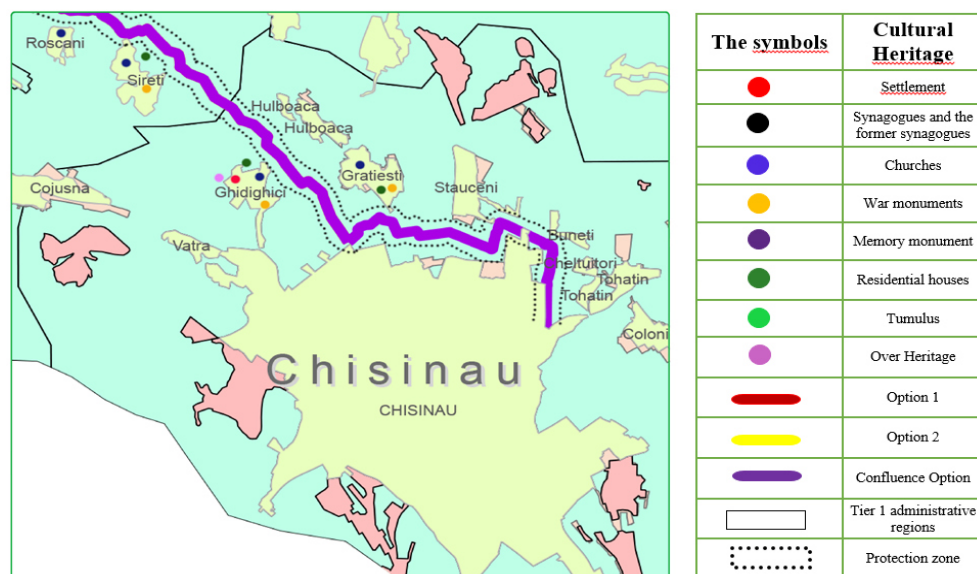




**Figure 16-5: Cultural heritage sites on the potential affected localities (Calarasi district)**



**Figure 16-6: Cultural heritage sites on the potential affected localities (Straseni district)**



**Figure 16-7: Cultural heritage sites on the potential affected localities (Mun. of Chisinau)**

## 16.5 Authorized agents for management of recyclable waste

Intreprinderilor, care dispun de autorizații pentru desfășurarea activităților de gestionare a deșeurilor:

Nr. d/o	Nr. autorizației	Denumirea întreprinderii	Genul de activitate a întreprinderii	Termenul de emitere și valabilitate a autorizației
1.	024/2010	S.R.L. „Filada Plast”, mun. Chișinău, str. M. Dosoftei 97/2 ap.6, tel.069155951	Autorizație nr. 024/2010 pentru efectuarea activităților de colectare și comercializare a deșeurilor din polietilenă.	15 iulie 2010 15 iulie 2015
2.	026/2010	S.C. „Junicard-Com” S.R.L., mun. Bălți, str. Crîlov 24; tel.0231-934-37	Autorizația nr. 026/2010 privind achiziția și prelucrarea deșeurilor nemetalice (hîrtie și carton, PE, PP; PVC, PET și deșeuri agricole).	20 iulie 2010 20 iulie 2015
3.	028/2010	S.C. „Panel-Sistem” S.R.L., mun. Chișinău, str. G. Călinescu 11, tel. 022-27-74-46	Autorizația 028/2010 privind gestionarea deșeurilor, inclusiv pentru colectarea, comercializarea deșeurilor din maculatură.	17 noiembrie 2010 17 noiembrie 2015
4.	029/2010	„Grijuliu” S.R.L., mun Chișinău, bd. Dacia, 49/3 ap.21, tel. 022-27-31-32	Autorizația 029/2010 privind gestionarea deșeurilor, inclusiv pentru colectarea, comercializarea deșeurilor din maculatură.	29 decembrie 2010 29 decembrie 2015
5.	030/2011	Mișcarea Ecologistă din Moldova OT. Chișinău, mun. Chișinău, str. M. Eminescu, 1, tel.022- 22-62-27	Autorizația 030/2011 privind activitățile privind recepționarea și stocarea temporară a anvelopelor uzate.	14 ianuarie 2011 14 ianuarie 2016
6.	031/2011	Î.M. „Salub Sireți”, r-nul Strășeni, s. Sireți, tel. 0237-92-940	Autorizație nr. 031/2011 privind colectarea selectivă, transportarea și depozitarea deșeurilor.	17 ianuarie 2011 17 ianuarie 2016
7.	033/2011	S.R.L. „ Finplast Prim”, mun. Bălți, str. Ștefan cel Mare, 195 tel. 069166577	Autorizația nr. 033/2011 privind colectarea sortarea, reciclarea și comercializarea deșeurilor nemetalice.	17 octombrie 2011 17 octombrie 2016
8.	034/2011	S.C. „Sălcioara Vascan” S.R.L. mun. Chișinău, str. Tighina, 49/2 tel. 022-422310/422302	Autorizația nr. 034/2011 privind colectarea comercializarea și prelucrarea deșeurilor din maculatura.	03 iunie 2011 03 iunie 2016
9.	035/2011	S.A. „Lafarge Ciment (Moldova)”. or. Rezina, str. Vinului 1, tel. 254-55-555	Autorizația nr.035/2011privind colectarea (depozitarea temporară și incinerarea deșeurilor din cauciuc).	1 octombrie 2011 1 octombrie 2016

10.	036/2011	S.A. „INCONARM” mun. Chișinău, str. Petricani 86, tel. 022-29-39-32	Autorizație nr. 036/2011 privind colectarea și utilizarea deșeurilor petrolier pentru necesitățile domeniului de producător.	6 ianuarie 2012 6 ianuarie 2017
11.	037/2012	F.P.C. „ABS” S.R.L., mun. Chișinău, str. Grădina Botanică nr. 9, tel. 022-533-789, 022-539-998	Autorizație nr. 037/2012 privind colectarea și prelucrarea deșeurilor din mase plastice.	27 iunie 2012 27 iunie 2017
12.	038/2012	I.C.S. „Vilagos” S.R.L., mun. Chișinău, str. 31 august 1989, nr. 29/1, tel. 022-271-893	Autorizație nr. 038/2012 privind gestionarea deșeurilor reciclabile.	13 martie 2012 13 martie 2017
13.	039/2012	S.R.L. „Vaniș-Prim” mun. Chișinău, I. Pelivan, nr. 17/1, ap. 64, tel. 022-47-26-61	Autorizația nr. 039/2012, privind colectarea și prelucrarea deșeurilor galvanice, a substanțelor chimice cu termen expirat și lămpi luminescente uzate.	17 aprilie 2012 17 aprilie 2017
14.	040/2012	S.R.L. „VEALVIT- AGRO”, s. Cernița, r- nul Florești, tel. 022-23-34-29, 0696123705	Autorizație nr. 040/2012 privind colectarea și comercializarea deșeurilor.	10 mai 2012 10 mai 2017
15.	041/2012	Î.M.C.C.P. „AD REM” S.R.L. mun. Chișinău, str. M.Viteazu, nr. 25, tel. 022 29-39-22	Autorizație 041/2012 privind colectarea uleiurilor uzate de automobile și utilizarea acestora în cazane pentru încălzire.	30 iulie 2012 30 iulie 2017
16.	042/2012	I.C.S. „ECORECYCLE” S.R.L. mun. Chișinău, str. 31 august 1989, nr. 35, ap. (of.) 1, tel. 022-54-04-56	Autorizație 042/2012 privind colectarea, depozitarea, presarea, comercializarea și transportarea deșeurilor din masă plastică (polietilenă, PET), hîrtie și sticlă.	19 septembrie 2012 19 septembrie 2017
17.	043/2012	Î.M. „SALUBR-LEOVA” or. Leova, str. I. A. Teodorovici, nr. 5, tel. 0263-24-575	Autorizație 043/2012 privind colectarea, depozitarea, presarea, comercializarea și transportarea deșeurilor menajere solide, inclusiv a deșeurilor reciclabile din masă plastică (polietilenă, PET), hîrtie și sticlă.	01 noiembrie 2012 01 noiembrie 2017
18.	032/2011	S.C. „Ursachi- Trans”, mun. Chișinău, str. O. Chibu 7/1, ap. 75, tel. 0 22 -815-112, 0 22-815-111	Autorizația nr. 032/2011 privind colectarea, prelucrarea și comercializarea deșeurilor de polietilenă PET și alți polimeri.	18 aprilie 2011 18 aprilie 2016

19.	046/2012	Î.C.S „Energia PPM,, S.R.L, bd. Decebal 71/2, mun. Chişinău, tel. 022-571-391, 078883844.	Autorizația nr. 046/2012 privind colectarea, transportarea și depozitarea deșeurilor din ulei alimentar uzat.	29 martie 2012 29 martie 2017
20.	044/2012	S.A .T. Î, Uzina ,, Moldavizolit,, or. Tiraspol, str. Șevcenko, 90, tel. (373 533) 94- 228/93-238.	Autorizația nr. 44/2012 privind colectarea, depozitarea, presarea, comercializarea, transportarea deșeurilor din hîrtie, carton, și a resturilor acestora.	24 decembrie 2012 29 decembrie 2017
21.	047/2013	S.R.L. ,,TRISUMG,, str. Muncii 1 a, or. Cahul, tel. 0299-41-777, 067377847	Autorizația nr. 047/2013 privind colectarea și comercializarea deșeurilor din cauciuc și plastic.	20 mai 2013 20 m1i 2018
22.	048/2013	S.R.L „RECWASTE,, mun. Chişinău 5, of . 20a, tel. 022-244-721	Autorizația nr. 048/2013 privind colectarea deșeurilor de echipamente, electrice și electronice, trasnportarea, depozitarea și comercializarea lor.	5 august 2013 5 august 2018
23.	049/2013	S.R.L. ,,Salubris – Grup,, , str. Sovietelor 14, s. Porumbeni, r-nul Criuleni, tel. 069155152	Autorizația nr. 049/2013 privind colectarea, depozitarea și separarea selectivă a deșeurilor din hîrtie, sticlă și plastic.	07 august 2013 07 august 2018
24.	050/2013	Cooperativa „POLIVTOR,, mun. Bălți, str. Coroban, nr. 29, tel. 0 231-371-11, 069127337	Autorizația nr. 050/2013 privind colectarea și prelucrarea deșeurilor din polietilenă.	05 septembrie 2013 05 septembrie 2018
25.	051/2013	, S.R.L. „UISPAC,, mun .Chişinău, str. N. Milescul Spatarul, 75, tel. 0 22-350-175	Autorizația nr. 051/2013 privind colectarea, prelucrarea și comercializarea deșeurilor din masă plastică.	13 septembrie 2013 13 septembrie 2018
26.	052/2013	S.R.L.,REV ECOLOGIC,, s. Puhoi, r-nul Ialoveni, tel. 079332307	Autorizația nr. 52/2013 privind colectarea, selectarea și balotarea deșeurilor de ambalaje PET și folie de polietilenă.	09 octombrie 2013 09 octombrie 2018
27.	045/2013	Î.M „Direcția de Producție a Gospodăriei Comunale și de Locuințe din Sîngerei,, tel. 0262 25094/ 25021	Autorizația 045/2013 privind colectarea, transportarea și depozitarea deșeurilor menajere solide.	02 septembrie 2013 02 septembrie 2018
28.	053/2014	G.Ț „Morari Vasile Ion,, mun.Chişinău, s. Colonița, str. Tohatin 10, tel. 079404291	Autorizația 053/2014 privind prelucrarea deșeurilor animaliere și producerea biogazului în scopul obținerii energiei.	10 iunie 2014 10 iunie 2019

29.	054/2014	S.R.L „ECO PRIVAT,, mun. Chişinău, or. Vadul lui Vodă, str. A. Onică, 46, tel. 079767884, 069767884.	Autorizația 054/2014 privind colectarea, transportarea și depozitarea deșeurilor menajere solide.	07 iulie 2014 07 iulie 2019
30.	055/2014	S.R.L „Eco Management,, r-nul Glodeni, s. Duşmani, tel. 068132167, 079006885.	Autorizația 055/ 2014 privind colectarea și valorificarea deșeurilor reciclabile, hîrtie/carton, folie, Pet-uri, sticlă, materiale plastice.	22 iulie 2014 22 iulie 2019
31.	056/2014	S.R.L „Diversacces,, r-nul Glodeni, s. Sturzovca, tel. 079758005, 068830304.	Autorizația 056/2014 privind colectarea și depozitarea deșeurilor reciclabile, hîrtie/carton, folie, PET.	02 septembrie 2014 02 septembrie 2019
32.	057/2015	S.R.L. „EuroPaperPack,, mun. Chişinău, str. Uzinelor, 9/3, tel. 0 22 41 11 02/ 41-13-39	Autorizația 057/2015 privind colectarea și reciclarea maculaturii și celulozei pentru producerea hîrtiei și cartonului	12 ianuarie 2015 12 ianuarie 2020
33.	058/2015	Cooperativa de Producție „Entuziast,, mun. Chişinău, str. Florilor, 1, tel. 069986117, 022 243405.	Autorizația 058/2015 privind colectarea și valorificarea deșeurilor și resturilor provenite din prelucrarea metalelor prețioase.	29 ianuarie 2015 29 ianuarie 2020
34.	059/2015	S.R.L.,CANDELUX-COM,, mun. Chişinău, str. Gheorghe Tofan, 6, ap. (of.) 49, tel. 022 422302	Autorizația 059/2015 privind colectarea, depozitarea și reciclarea deșeurilor de hîrtie și carton pentru producerea hîrtiei igienice.	03 aprilie 2015 03 aprilie 2020
35.	060/2015	Instituția Privată „MOLDREC,, mun. Chişinău, str. Columna, 135, of. 3, tel. 060121112	Autorizația 060/2015 privind colectarea, transportarea, depozitarea și comercializarea deșeurilor de echipamente electrice și electronice.	21 mai 2015 21 mai 2020
36.	061/2015	S.R.L. „TRISUMG,, or. Cahul, str. Muncii, nr. 1 „a,, tel. 0299-41777	Autorizația 061/2015 privind prelucrarea deșeurilor din cauciuc și plastic prin metoda de piroliză.	04 iunie 2015 04 iunie 2020

## **16.6 Public Consultation and Disclosure Plan**

*Please refer to the separate document*

# Public Consultation and Disclosure Plan

## ***Preliminary***

### Ungheni-Chisinau Natural Gas Pipeline



Guvernul Republicii Moldova  
**Ministerul Economiei**



*The study is financed through technical assistance from the Government of Sweden and SIDA.*

**FICHTNER**



# FICHTNER

Sarweystrasse 3  
70191 Stuttgart • Germany  
Phone: +49 711 8995-0  
Fax: +49 711 8995-459  
[www.fichtner.de](http://www.fichtner.de)

**Please contact:** Sofia Sousa  
**Extension:** 726  
**E-mail:** [sofia.sousa@fichtner.de](mailto:sofia.sousa@fichtner.de)

Rev No.	Rev-date	Contents /amendments	Prepared/revised	Checked/released
0	24.07.2015	Public Consultation and Disclosure Plan - Preliminary Draft Report	Sousa/Fricke	Ivenz-Heidt
1	26.12.2015	Public Consultation and Disclosure Plan - Preliminary Draft Final Report	Sousa	Ivenz-Heidt
2	12.02.2016	Public Consultation and Disclosure Plan - Preliminary Draft Final Report	Sousa	Ivenz-Heidt
3	01.03.2016	Public Consultation and Disclosure Plan - Preliminary Draft Final Report	Sousa	Ivenz-Heidt

# Table of Contents

<b>Table of Contents</b>	<b>I</b>
<b>List of Figures</b>	<b>I</b>
<b>List of Tables</b>	<b>I</b>
<b>Abbreviations</b>	<b>I</b>
<b>2. Introduction</b>	<b>2-1</b>
2.1 Summary of main responsibilities	2-2
2.2 Stakeholders	2-2
2.3 Project description	2-3
<b>3. Public Consultation Regulations and Requirements</b>	<b>3-1</b>
3.1 National framework	3-1
3.1.1 Law No. 86 of May 29, 2014 on Environmental Impact Assessment of the Republic of Moldova	3-1
3.2 International framework	3-2
3.2.1 EBRD's Environmental and Social Policy (2008)	3-2
3.2.2 EBRD's Public Information Policy (2014)	3-4
3.2.3 EIB's Environmental and Social Handbook (2013)	3-4
<b>4. Summary of previous stakeholder engagement activities</b>	<b>4-7</b>
<b>5. Project Stakeholders</b>	<b>5-1</b>
<b>6. Information disclosure and consultation methods</b>	<b>6-1</b>
6.1 Information Disclosure	6-1
6.1.1 Disclosure of information during the EIA preparation	6-2
6.1.2 Disclosure of information during construction	6-5
6.1.3 Disclosure of information during operation	6-5
6.1.4 Platforms for disclosure of information	6-6
6.2 Public Consultation	6-8
6.2.1 Techniques for Public Consultation	6-9
6.2.2 Public Consultation during the EIA preparation	6-10
6.2.3 Public Consultation during construction and operation	6-13
6.3 Documentation	6-13
<b>7. Grievance Mechanism</b>	<b>7-1</b>

7.1	General public grievance mechanism	7-1
7.2	Workers grievance mechanism	7-2
<b>8.</b>	<b>Timetable</b>	<b>8-1</b>
<b>9.</b>	<b>Resources and responsibilities</b>	<b>9-1</b>
9.1	Developer - MoE	9-1
9.1.1	MEPIU	9-1
9.2	Responsible authority - MoEn	9-2
9.3	Contractors	9-2
9.4	District and local governments	9-3
9.5	Consulting Engineer	9-3
<b>10.</b>	<b>Reporting</b>	<b>10-4</b>
10.1	During ESIA preparation	10-4
10.1.1	Response to comments to the ESIA documents	10-4
10.1.2	Public Participation Report	10-4
10.2	During construction and operation	10-5
<b>11.</b>	<b>References</b>	<b>11-1</b>
<b>12.</b>	<b>Annexes</b>	<b>12-1</b>
12.1	Annex 1 - Disclosure of the filing of the Application	12-1
12.2	Annex 2 - Preliminary Assessment of the planned activities (second decision after consultation with the Romanian Authorities)	12-2
12.3	Annex 3 - Newspaper announcement of the availability of the draft EIA Program	12-3
12.4	Annex 4 - Tier-1 governments in the project area	12-5
12.5	Annex 5 - List of media in the project area	12-1
12.6	Annex 6 - Stakeholder log (as of 01.03.2016)	12-2
12.7	Annex 7 - Public Grievances Form	12-6

## List of Figures

Figure 1-1:	Sketch of the Pipeline System	2-3
Figure 1-2:	Overview of the route Option 1b	2-4
Figure 11-1:	Announcement on the edition of 03.04.2015 of the Expresul (Ungheni)	12-3
Figure 11-2:	Announcement on the edition of 03.04.2015 of the Unghiul	12-4
Figure 11-3:	Announcement on the edition of 27.03.2015 of a national newspaper	12-4

## List of Tables

Table 2-1:	Summary of EBRD's PR 10	3-2
Table 2-2:	Summary of EIB's ESS 10	3-5
Table 3-2:	Description of the stakeholder engagement activities undertaken since the beginning of the EIA phase	4-9
Table 4-1:	Stakeholder Analysis List	5-3
Table 5-1:	Different techniques for undertaking Public Consultation (ADB, 2012)	6-9
Table 7-1:	EIA Timetable, including the Stakeholder Engagement Schedule	8-2
Table 7-2:	Stakeholder Engagement Schedule during construction and operation	8-8

## Abbreviations

CLO = Community Liaison Officer  
 EBRD = European Bank for Reconstruction and Development  
 EIA = Environmental Impact Assessment  
 EIB = European Investment Bank  
 EU NIF = European Union Neighborhood Investment Facility  
 ESIA = Environmental and Social Impact Assessment  
 ESMP = Environmental and Social Management Plan  
 EU = European Union  
 HSE = Health, Safety and Environment  
 IFIs = International Financing Institutions  
 IPOT = The State Planning Institute for Land Management  
 MoE = Ministry of Economy of the Republic of Moldova  
 MoEn = Ministry of Environment of the Republic of Moldova  
 PAPs = Project Affected Persons  
 PCDP = Public Consultation and Disclosure Plan  
 ToR = Terms of Reference

## 2. Introduction

Within the context of the Moldova Energy Strategy, Moldova and Romania signed a Memorandum of Understanding (the “MoU”) on the development and construction of a gas interconnector (Iasi-Ungheni) between the natural gas transmission systems of the two countries and of a gas compression station located in Romania. This pipeline has been inaugurated in August 2014. In addition, the Ministry of Economy (MoE) of Moldova has decided to extend the pipeline for approx. 115 km on the Moldovan side to link Ungheni with Chisinau, the capital and biggest consumption area (the Project).

The European Bank for Reconstruction and Development (“EBRD”) has been requested by the Ministry of Economy of the Republic of Moldova to co-finance together with the European Investment Bank (“EIB”) and the EU Neighborhood Investment Facility (“EU NIF”) the construction of this new Ungheni-Chisinau gas pipeline.

The present draft **Public Consultation and Disclosure Plan** (PCDP) is prepared within the context of the Environmental and Social Impact Assessment (ESIA or EIA) of the Ungheni-Chisinau pipeline project.

The expression “Environmental and Social Impact Assessment” (ESIA) is applied preferably by the IFIs, while the expression “Environmental Impact Assessment” (EIA) is used in the EU and the Moldovan legislation. Both will be used alternatively in this report and they have the same meaning in this context.

The PCDP describes the strategy and program to be implemented for engaging with the stakeholders of the Ungheni-Chisinau Pipeline Project in a culturally and timely appropriate manner. The goal is to ensure the timely provision of relevant and understandable information and to create a process that provides opportunities for stakeholders to express their opinions, aspirations and suggestions about environmental measures, land acquisition and social impacts of the project, and that allows the government of Moldova to consider and respond to them.

The present PCDP follows closely the table of contents as suggested in the EIB’s Environmental and Social Handbook (2013), including, as therefore:

- an introduction (Section 2);
- a description and brief summary of the relevant regulations and requirements regarding public consultation, both national and international (Section 3);
- a summarized description of the stakeholder engagement activities previously undertaken (Section 4);
- identification of the project’s stakeholders (Section 0);
- the information disclosure measures (including the type of information to be disseminated and the method of dissemination) (Section 6.1);

- the consultation and participation mechanisms to be used during the different stages of the project cycle (Section 6.2);
- a timetable for undertaking the engagement activities (Section 8);
- the definition of the resources to be allocated for implementation of the plan and the responsibilities (Section 9);
- the creation of a grievance mechanism (Section 7);
- the description of the monitoring and reporting requirements (Section 10).

The planning of the stakeholder engagement activities in this PCDP has been made under consideration of the Law No. 86 on Environmental Impact Assessment (EIA) of the Republic of Moldova and the requirements of the IFIs (International Financing Institutions) EBRD and EIB.

## **2.1 Summary of main responsibilities**

The implementation of the PCDP is the responsibility of the project's developer or initiator, the Ministry of Economy. This implies the review and monitoring of the implementation of the PCDP, as well as the organization of the public engagement activities (disclosure of reports and other info; public debates; answer to comments; liaison with Tier-1 and Tier-2 governments).

The responsible authority as per the Law No. 86 on EIA is the Ministry of Environment (MoEn). The MoEn shall review and issue its opinion and/or approval to the documents submitted by the MoE related to the EIA process. It shall in addition overview the stakeholder engagement process.

Fichtner's role in the process consists of the elaboration of the present PCDP and other ESIA-related documentation, as well as the support in the disclosure and consultation activities.

More details on the responsibilities within the PCDP can be consulted on Section 9.

## **2.2 Stakeholders**

Stakeholders are those who will be or are likely to be directly or indirectly affected, positively or negatively, by a project (commonly referred to as project affected people or project affected communities), as well as those who might have an interest in, or may influence, the project (the "interested parties") (EIB, 2013; EBRD, 2008). Stakeholders may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests, the academic community, or other businesses (IFC, 1998).

The "stake" that each of these different individuals or groups has in a project or investment will vary. For example, there may be people directly

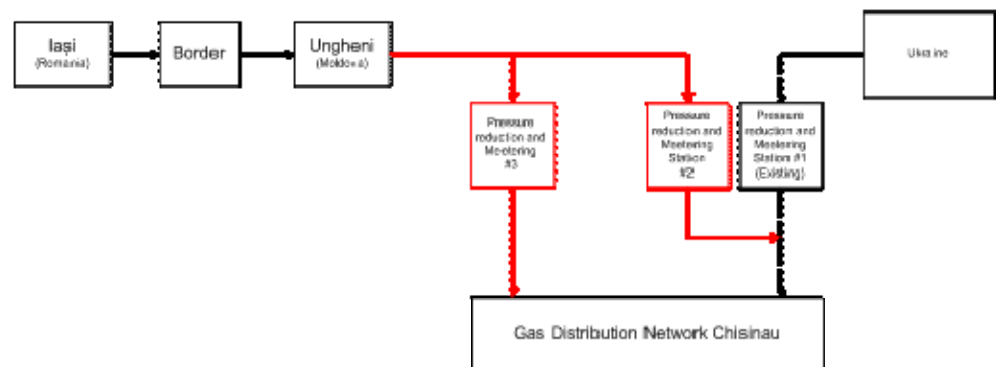
affected by the potential environmental or social impacts of a project (the project affected people or PAP ). Others may wish to communicate their concerns or suggestions to the project company as part of their mandates (such as environmental or social nongovernmental organizations (NGOs)). There are also those who might have a legal saying over the project, such as governmental authorities and agencies. Others, such as the media, are stakeholders in the sense that they disclose information related to it.

A list of stakeholders for the project can be found in Section 5.

## 2.3 Project description

The Ungheni-Chisinau Natural Gas Pipeline can be seen as extension of the existing Romanian-Moldovan Interconnector Pipeline. The new pipeline will tie-in into the existing Interconnector close to Ungheni and will transport the gas to Chisinau.

A sketch of the relevant pipeline system is given in Figure 2-1. The sections which are subject of this project are marked in red.



**Figure 2-1: Sketch of the Pipeline System**

The main components of the Ungheni-Chisinau Pipeline project are:

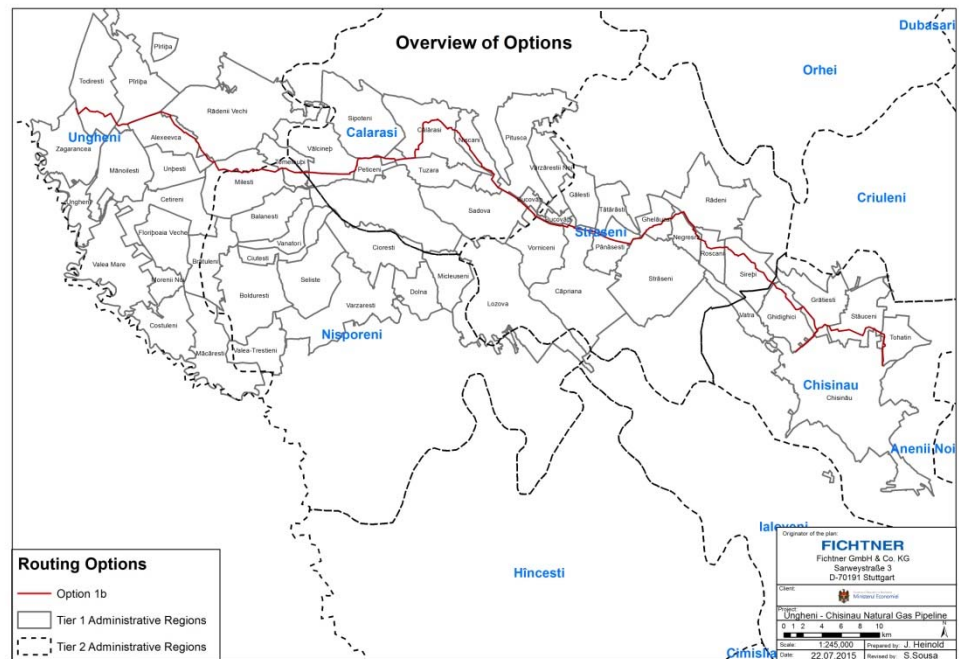
- Pipeline;
- 5 Block Valve Stations;
- 2 Gas Pressure Regulation Stations (GPRS);
- 3 Pig Launcher Stations;
- 3 Pig Receiver Stations.

The design of the pipeline is characterized by the following parameters:

- Pipeline Diameter      DN 600
- Length                      119 km
- Max. operation pressure   50 bar
- Design pressure            55 bar
- Peak capacity                approx. 235.000 Nm<sup>3</sup>/h (at 15 °C)

For high pressure gas pipeline design and construction, the design on the territory of the Republic of Moldova shall be carried out according to the provisions of the construction norms SNiP 2.05.06-85 Main gas pipelines, SNiP 2.04.12 – Strength calculation for steel pipelines, CN 453-73 Norms for land allotment for trunk pipelines, and SNiP III-42-80 Rules for carrying out and handing over the works - main pipes.

A Basic Routing Study for the pipeline has been performed by IPOT, the State Planning Institute for Land Management (Fichtner and IPOT, 2014). Three routing options, one of them including one sub-option, have been developed. During the pre-feasibility stage and the elaboration of the Environmental Impact Assessment, an evaluation of the routing options was carried out under consideration of the economic, schedule, financial, political, technical, environmental and social risks. It has been concluded that Option 1b is the one which shall be considered for the project (Figure 2-2).



**Figure 2-2: Overview of the route Option 1b**



### 3. Public Consultation Regulations and Requirements

This Section provides for a brief description of the national regulation of Moldova concerning the public participation in the process of EIA. Also the financing agencies' requirements in these matters are summarized.

The present PCDP and the corresponding procedures are/will be undertaken based on these regulations and requirements.

#### 3.1 National framework

##### 3.1.1 Law No. 86 of May 29, 2014 on Environmental Impact Assessment of the Republic of Moldova

The Law No. 86 of May 29, 2014 on Environmental Impact Assessment of the Republic of Moldova is a partial transposition of the Directive 2011/92/EU the European Parliament and Council from December 13, 2011 about the assessment of impact of some state and private projects on the environment.

The law establishes the principles of EIAs, defines the scope of the EIA, the powers of competent authorities and the application procedure for planned activities. It defines, in addition, the procedures for public consultation and participation in the EIA process, which are the focus of this section. The main points are as follows:

##### **Access to and comments on documentation**

- The public shall be given the opportunity to have access to the EIA related documents and to comment on some of them as follows:
  - Application regarding planned activities (Article 7(2)) - access;
  - Preliminary assessment of the planned activities (Article 10(2)) - access;
  - Draft EIA ToR/Program (Article 19) - access and comments;
  - Draft EIA Report (Article 21) - access and comments.

##### **Public debates (Article 22)**

- The developer is obliged to review the public opinion by means of public consultations (public debates and written comments).
- Public debates shall be conducted in the territory of the local public authority where the planned activity is to be implemented.
- Information of the public about the conduct of public debates:
  - adverts in the mass-media, official web-page of the developer and local governments of the project area, posts at public places and the offices of the local governments;
  - the advert shall be put out no sooner than 10 days before launching the public debates.
- The findings of the public debates shall be entered in a minute (indication of the total number of participants, list of questions, objections and proposals put forth).

- The minute shall be drawn up within 3 days following the date of the conduct of the public debates and shall be signed by the chairperson of the meeting on the public debates.
- The answers to the questions posed during the public debates shall be made during the debate or within 15 days.
- Following the public debates and written comments received, the developer shall prepare a public participation report which shall be an integral part of the environmental impact assessment documentation.

## 3.2 International framework

### 3.2.1 EBRD's Environmental and Social Policy (2008)

The EBRD's Environmental and Social Policy (ESP) is created in the context of recognition that financing sustainable development, in its social and environmental dimensions, must rank among the highest priorities of its activities.

In order to translate this objective into successful practical outcomes, the Bank has adopted a comprehensive set of specific Performance Requirements ("PRs") that clients are expected to meet, covering key areas of environmental and social impacts and issues.

In the context of the PR 10 (Information Disclosure and Stakeholder Engagement), the EBRD considers that effective community engagement is central to the successful management of risks and impacts on communities affected by projects, as well as central to achieving enhanced community benefits. Stakeholder engagement is an ongoing process involving (i) the client's public disclosure of appropriate information so as to enable meaningful consultation with stakeholders, (ii) meaningful consultation with potentially affected stakeholders and (iii) a procedure or policy by which people can make comments or complaints (grievance mechanism). Table 3-1 presents a summary of the PR 10.

**Table 3-1: Summary of EBRD's PR 10**

Subject of the PR 10	Summarized description
General requirements	<ul style="list-style-type: none"> <li>• Stakeholder engagement will be free of manipulation, interference, coercion, and intimidation, and conducted on the basis of timely, relevant, understandable and accessible information, in a culturally appropriate format.</li> <li>• The nature and frequency of stakeholder engagement will vary from project to project, depending on the risks to and adverse impacts on the affected communities, the sensitivity of the sector and environment, and the level of public interest.</li> <li>• The requirements of national law and international commitments must always be met.</li> </ul>
Engagement during	The client will:

Subject of the PR 10	Summarized description
project preparation	<ul style="list-style-type: none"> <li>• Identify the affected and interested parties;</li> <li>• Individuals which may be disproportionately affected;</li> <li>• Identify how stakeholders will be affected and the extent of the potential impacts;</li> <li>• Undertake a scoping process with the identified stakeholders for Category A projects, including development of a Stakeholder Engagement Plan;</li> <li>• Disclose relevant information in the local language(s) and in a manner that is accessible and culturally appropriate, taking into account any vulnerable people: <ul style="list-style-type: none"> <li>• Purpose, nature and scale of the project;</li> <li>• Duration of the project's activities;</li> <li>• Risks and impacts associated;</li> <li>• The consultation process;</li> <li>• Time/venue of public meetings and the process by which meetings are notified, summarized and reported;</li> <li>• The ESAP and EIA/SIA for Category A projects;</li> <li>• The Non-Technical summary of the ESAP for other project categories.</li> </ul> </li> <li>• Undertake a process of meaningful consultation on a manner that is inclusive and culturally appropriate where workers and/or affected communities are, or may be, subject to significant risks or adverse impacts from a project.</li> </ul>
Engagement during project implementation and external reporting	<ul style="list-style-type: none"> <li>• The client will provide ongoing information and receive feedback from identified stakeholders: <ul style="list-style-type: none"> <li>• On the effectiveness of the implementation of the mitigation measures;</li> <li>• On the affected communities' ongoing interests and concerns.</li> </ul> </li> </ul>
Grievance mechanism	<ul style="list-style-type: none"> <li>• The client will establish a grievance mechanism, process, or procedure to receive and facilitate resolution of stakeholders' concerns and grievances about the client's environmental and social performance.</li> <li>• It should address concerns promptly and effectively, using an understandable and transparent process that is culturally appropriate and readily accessible;</li> <li>• It shall be provided at no cost;</li> <li>• The client will inform the affected communities about the grievance process and publicly and regularly report on its implementation.</li> <li>• Grievance mechanisms for workers (PR 2) will be separate from public grievance mechanisms.</li> </ul>
Corporate finance	<ul style="list-style-type: none"> <li>• Clients with multi-site operations in receipt of general corporate finance, working capital or equity financing will adopt and implement a corporate stakeholder information and communication programme including a grievance mechanism.</li> </ul>

### 3.2.2 EBRD's Public Information Policy (2014)

The Public Information Policy of the EBRD (May 2014) sets out how the bank discloses information and consults with its stakeholders so as to promote better awareness and understanding of its strategies, policies and operations.

For Category A projects, in addition to the disclosure required of the clients under the Environmental and Social Policy (Table 3-1), the bank will make the ESIA publicly available a minimum of 60 calendar days prior to consideration of the project by the Board of Directors for private sector projects and 120 calendar days prior to Board consideration for public sector projects.ESIAs are made available in local language and may be available in whole or in part in other languages, where appropriate.

### 3.2.3 EIB's Environmental and Social Handbook (2013)

EIB defined a set of 10 Environmental and Social Standards (ESS) which are described in the Environmental and Social Handbook (2013). The ESS 10 regards stakeholder engagement.

Standard 10 outlines a systematic approach to stakeholder engagement that the promoter is expected to build and maintain by way of a constructive relationship with relevant stakeholders. It affirms the EIB's expectation that promoters uphold an open, transparent and accountable dialogue with all relevant stakeholders at the local level targeted by its EIB operations. Table 2-2 presents a summary of the EIB's ESS 10.

**Table 3-2: Summary of EIB's ESS 10**

Subject of the ESS 10	Summarized description
Overarching Requirements	<ul style="list-style-type: none"> <li>Stakeholder engagement, including disclosure and dissemination of information, will be: <ul style="list-style-type: none"> <li>Free from discrimination;</li> <li>Based on the principles of prior, informed and free engagement and informed participation;</li> <li>Be initiated early in the process of assessment of impacts;</li> <li>Be inclusive of the affected communities and other interested parties;</li> <li>Be accessible to any vulnerable groups;</li> <li>Be adequately documented.</li> </ul> </li> </ul>
<u>Procedural Requirements:</u>	
Stakeholder Identification and Analysis	<ul style="list-style-type: none"> <li>The promoter will be comprehensive in identifying and prioritizing all project stakeholders in the given context;</li> <li>Stakeholder analysis needs to clearly identify and differentiate between the different types of stakeholders;</li> <li>Particular attention will be placed upon the identification of vulnerable PAPs.</li> </ul>
Engagement Planning	<ul style="list-style-type: none"> <li>In case of projects with significant expected impacts, the promoter shall engage in a scoping process with identified PAPs and other stakeholders which will: <ul style="list-style-type: none"> <li>Ensure that all key issues to be studied in the ESIA are considered;</li> <li>Facilitate the development a Stakeholder Engagement Plan (SEP).</li> </ul> </li> <li>A second round of consultations will be undertaken once the draft ESIA/ESMP is ready.</li> </ul>
Information Disclosure	<ul style="list-style-type: none"> <li>The promoter will provide identified stakeholders with relevant information in a timely and appropriate manner, such as: <ul style="list-style-type: none"> <li>Purpose, nature, objectives and scale of the project;</li> <li>Duration of the activities;</li> <li>Available grievance mechanism;</li> <li>Envisaged consultation process;</li> <li>Etc.</li> </ul> </li> </ul>
Public Consultations	<ul style="list-style-type: none"> <li>The promoter will undertake a process of meaningful consultation with the PAPs and other stakeholders;</li> <li>This shall be done at strategic decision-making points and before any impacts is delivered;</li> <li>At minimum, the promoter will ensure that a regular, consistent and reliable platform of on-going dialogue and communication with stakeholders is maintained.</li> <li>The promoter will report to the stakeholders on the ultimate decisions.</li> <li>The promoter will review the effectiveness of previous public consultation processes.</li> </ul>
Free Prior Informed Consent (FPIC) for IP	<ul style="list-style-type: none"> <li>The FPIC process should produce a clear endorsement or rejection by the indigenous peoples</li> </ul>

Subject of the ESS 10	Summarized description
	<p>concerned of the proposed intervention and a statement of all accompanying mitigating and remedial measures and benefit-sharing agreements.</p> <ul style="list-style-type: none"> <li>• FPIC is expected to be established through good faith negotiation.</li> </ul>
Grievance Mechanism	<ul style="list-style-type: none"> <li>• The promoter will ensure that a grievance mechanism is introduced at project level at the very outset of project design that is: <ul style="list-style-type: none"> <li>• legitimate and trusted;</li> <li>• scaled to the risks and potential adverse impacts of the project;</li> <li>• fair, transparent and inclusive;</li> <li>• Etc.</li> </ul> </li> <li>• The promoter will introduce an effective feedback system to the mechanism, informing the affected communities about the project grievance process and its outcomes and reporting regularly to the public on its implementation.</li> </ul>
Monitoring and Reporting	<ul style="list-style-type: none"> <li>• Promoters are required to monitor the implementation of the stakeholder engagement plan and the performance of the grievance mechanism and report on both.</li> <li>• The promoter will arrange for all necessary provisions to assure stakeholder engagement during the monitoring phase.</li> <li>• The promoter will establish regular communication and reporting channels back to the communities and individuals impacted and concerned.</li> </ul>

The Volume II of the Handbook further describes the procedures for disclosure of information and documentation about the project's environmental and social implications. Its main points are as follows:

- The EIB has a Transparency Policy that is in line with international best practice and transparency standards of other EU bodies and institutions. The Policy gives the public the right to request disclosure of all information and documents held by the EIB.
- In line with the same policy, the EIB discloses on its website advance information on projects it considers for financing on a Project List (the so called "project pipeline") with associated project summaries.
- For projects on the Project List outside the EU where an ESIA is required, the environmental and social impact study (ESIS) of the ESIA will also be made available to the public, where possible through electronic links in the EIB's Project List, to the promoter's website.
- The promoter is responsible for making the documents available to the public in a language appropriate for local consultation and stakeholder engagement.

Annex 6 to the Volume II of the Handbook contains a suggested table of contents (TOC) for a Stakeholder Engagement Plan. The present PCDP follows closely this suggestion.

## 4. Summary of previous stakeholder engagement activities

During the preparation of the **pre-feasibility study** (Fichtner, 2014), including the Inception (Scoping) study (Fichtner, 2015), consulting and information disclosure activities with some stakeholder groups have been undertaken. Table 4-1 presents a summary of these activities.

Members of the private sector, government, scientific community and the financing institutions have been consulted in this initial phase to discuss technical, design, legal, policy and environmental issues. The feedback from these meetings has been incorporated into the studies undertaken by Fichtner up to now.

**Table 4-1: Description of the stakeholder engagement activities undertaken during the preparation of the pre-feasibility report**

Date and location	Stakeholders involved	Description
<b>Private sector</b>		
16.07.2014 Office of Gazproiect, Moldova	Gazproiect - Gazproiect is an engineering company that has the required license and resources to design HP main gas pipelines	Discussion of the project's background, design, routing, and feasibility study.
<b>Government</b>		
17.07.2014 Offices of the Ministry of Economy of Moldova	Ministry of Economy (MoE)	Handing over of the list of the members of the Working Group; handing over of documentation and technical standards; discussion of the project's design.
18.07.2014 Temporary office of Vestmoldtransgas, Moldova	Vestmoldtransgas - state company established for the operation of the Iasi – Ungheni – Chisinau pipeline.	Discussion of the project's routing and connection issues.
21.07.2014 MEPIU's office in Moldova	MEPIU (Moldova Energy Projects Implementation Unit)	Discussion of the project's design, routing and connection issues.
30.07.2014 ANRE's office in Moldova	ANRE (National Agency for Energy Regulation of Moldova)	Discussion of regulatory and legal issues
30.07.2014 Energocom's office in Moldova	S.A. Energocom - state owned company with the license for supply of electricity and gas with non-regulated tariffs.	Discussion of supply issues

Date and location	Stakeholders involved	Description
19.09.2014 Offices of the Ministry of Economy of Moldova	Ministry of Economy (MoE)	Disclosure of the work so far undertaken; discussion of technical, design, supply, demand, legal, budget and routing issues
23.09.2014 Offices of the Ministry of Finance, Moldova	Ministry of Finance	Discussion of taxes, other financial duties of the project, public procurement, sovereign guarantee, and the loan
15.10.2014 MEPIU's office in Moldova	MEPIU (Moldova Energy Projects Implementation Unit)	Discussion of the project's connection, costs, and technical and issues; discussion of timelines
15.10.2014 Offices of the Ministry of Economy of Moldova	Ministry of Economy, Public Property Agency, PPP Unit	Discussion of legal and regulatory issues related to PPP
16.10.2014 Offices of the Ministry of Economy of Moldova	Ministry of Economy, Advisor on Energy Policy to the Prime Minister's Office	Discussion of gas market and supply issues
16.10.2014 Offices of the Ministry of Economy of Moldova	Ministry of Economy	Brief the MoE on the progress of the routing work
16.10.2014 Offices of the Ministry of Environment, Moldova	State Environmental Inspection, subordinated to Ministry of Environment	Brief the Ministry of Environment on the project status; discussion of routing issues, EIA procedures, and permitting.
<b>International financing institutions</b>		
23.07.2014 Moldova	EBRD	Discussion of the project's capacity and background.
<b>Scientific community</b>		
17.10.2014 Academy of Science, Institute of Power Engineering	Academy of Science, Institute of Power Engineering	Discussion of gas consumption forecasts in Moldova
<b>Group meetings</b>		



Date and location	Stakeholders involved	Description
03.12.2014 Chisinau	Government ministries and agencies; EIB and EBRD; EU Delegation; Embassy of Romania SIDA	Workshop for presentation and discussion of the pre-feasibility study: routing, basis of design, environmental issues, investment recovery options, and economic/commercial issues.
04.12.2014 Chisinau	Ministry of Economy, EBRD, EIB	Workshop for discussion of the pre-feasibility study: economic/financial issues, Moldova/Romania co-operation, legal and regulatory development, PIU (Project Implementation Unit), procurement rules, co-operation with the Ministry of Environment, construction rules
04.12.2014 Chisinau	ANRE (National Agency for Energy Regulation of Moldova); EBRD; EIB	Discussion of the pre-feasibility study: economic/financial issues, legal and regulatory development, tariffs, gas distribution.

In the beginning of February 2015 the organization and planning of the ESIA and the feasibility study have started. Fichtner has been involved in group meetings undertaken for this purpose in Chisinau. After these meetings, the agenda for undertaking the ESIA activities has been agreed and the project's initiator (MoE) and responsible authority (MoEn) undertook some disclosure activities according to the legal requirements of the new EIA Law. A brief description of these activities is made in Table 4-2. Further details about these activities can be consulted throughout this PCDP.

**Table 4-2: Description of the stakeholder engagement activities undertaken since the beginning of the EIA phase**

Date and location	Stakeholders involved	Description
04.02.2015 05.02.2015 Chisinau	MoEn; MoE; EIB and EBRD; EU Delegation; Embassy of Romania; MEPIU; Working Group	Presentation of the MEPIU; discussion of the timeline for the EIA; clarifications about the new EIA Law; discussion about public debates; commercial considerations; technical issues; input data; coordination with the Romanian government; responsibilities and budget.
13.02.2015	MoE; MEPIU; Working Group; MoEn	The MoE, as the project's initiator, filed the "Application regarding planned activities" to the responsible authority (the MoEn).

Date and location	Stakeholders involved	Description
17.02.2015	MoEn; general public; affected people	The MoEn disclosed on its website that an Application for the Ungheni-Chisinau gas pipeline had been filed (Annex 1).
25.02.2015	MoEn; MoE; general public; affected people	The MoEn disclosed on its website and to the MoE the result of the Preliminary Assessment of the planned activities.
04.03.2015	MoEn; MoE; general public; affected people; tier-2 governments	The MoEn disclosed on its website, to the MoE and the tier-2 governments of the area the result of the <i>new</i> Preliminary Assessment of the planned activities (after discussion with the Romanian authorities) (Annex 2).
20.03.2015	MoE; general public; affected people	The MoE published the draft EIA Program on the MEPIU's and the MOE's websites
20.03.2015 25.03.2015	MoE; tier-2 governments	The MoE disclosed the draft EIA Program per letter and e-mail to the 5 potentially affected district councils
25.03.2015	MoE; MoEn	The MoE disclosed the draft EIA Program to the MoEn for evaluation and comments
30.03.2015	MoE; tier-2 governments	The MoE printed 5 hard copies of the draft EIA Program and distributed them among the 5 district councils.
27.03.2015 and 03.04.2015	MoEn; national and local newspapers; general public; affected people	Advertisements have been published in newspapers announcing that the draft EIA Program was available for public comments (Annex 3)

## 5. Project Stakeholders

Stakeholders are those who will be or are likely to be directly or indirectly affected, positively or negatively, by a project (commonly referred to as project-affected people or project-affected communities), as well as those who might have an interest in, or may influence, the project (the “interested parties”) (EIB, 2013; EBRD, 2008).

An important first step in undertaking stakeholder engagement is to identify stakeholders and develop a database of these individuals/groups and their contact information. Existing databases/contact lists can be utilized to support stakeholder identification. This provides the project with contact information of potentially affected individuals at a local, regional and national level.

Generally, stakeholders can be distributed in the following three groups (adapted from ADB, 2012 and IFC, 1998):

### **a) Civil society:**

- General public: directly or indirectly affected population groups and subgroups (e.g., youth, girls, and women’s groups), and ethnic minority groups:
  - People owning land or assets impacted by the project, both on- and off-site.
  - People using agricultural land or natural resources, such as forests or rivers.
  - Squatters already on-site.
  - Immigrants attracted to the project and its potential labor benefits prior to implementation.
  - People’s organizations and institutions affected by the project, such as village development associations, recreational groups, women’s groups, farming and fishing cooperatives, and religious groups.
  - Locally disadvantaged and voiceless groups, such as the poor and women.
  - Indigenous or tribal peoples with special ties to land, or who have specific land, resource, and cultural rights that may be protected by national or international law.
  - People from surrounding villages who may be potential sources of labor.
- Civil society organizations: national and international NGOs, community-based organizations, foundations, labor unions, and independent research institutes.
- Informal representatives: scientific community, school teachers, religious leaders.

### **b) Government:**

- Central Government: civil servants in ministries, cabinets, etc.

- Representative assemblies: elected government bodies (e.g., parliament, national and local assemblies, and elected community leaders)
- Bilateral and multilateral government institutions: international financial institutions, bilateral government donors, etc.

**c) Private Sector:**

- Private companies (including suppliers, customers, and contractors), umbrella groups representing groups in the private sector, and chambers of commerce.
- The media.

The information obtained so far shows that no squatters exist in the area, but that there are people occupying land for which they have no official written title. After the Soviet Union has been dismantled, the people received the land they have been working on. However, due to reasons still not clear, some of these owners never received or applied for a formal land title.

There are ethnic minorities in the area (Roma, Ukrainians, Jews, Russians, Romanians, Bulgarians, etc.), but it is not expected that these are directly affected by the project.

As stakeholders are identified, it is necessary to understand their level of interest and influence over the project, as well as the extent to which they are impacted (directly or indirectly).

Table 4-1 lists the stakeholders identified so far for this project.

**Table 5-1: Stakeholder Analysis List**

Stakeholders	Stakeholder Interest	Perception of the problem/Issues to be discussed	Resources	Mandate in the project's context	Contact data
<b>Civil Society</b>					
Land owners subject to land and/or financial compensation	They will lose private land and potentially productive land, as well as agricultural assets	Timely and fair financial compensation for land and crops	Land and agricultural assets	Not applicable	Not yet available. To be defined during the detailed design phase by means of a survey.
Inhabitants of Ungheni, Calasari, Straseni, and Chisinau - Option 1b	They can be directly affected by environmental and social issues  They can be potential sources of labor	Environmental and social impacts of the project; Environmental and Social Management Plan; Job opportunities	Work force  Public resources (air, water, soil, forests)	Not applicable	Not applicable. People are involved through the local governments.
Villagers from surrounding areas	They can be potential sources of labor	Job opportunities	Work force	Not applicable	Not applicable. People are involved through the local governments.
BIOTICA, Ecological Association	To be aware and comment on the environmental impacts of the project	Environmental impacts of the project; public consultation process; Environmental and Social Management Plan	Internal budget and staff	BIOTICA is active in the field of biodiversity conservation. It participates in developing management plans for protected areas, drafting regulations and plans.	Mun. Chisinau, str. N. Dimo, 17/4 ap.22 fax: 0-22-495625; tel: 0-22-498837; 0-22-434726 <a href="http://www.biotica-moldova.org">http://www.biotica-moldova.org</a>
Ecological Movement of Moldova (including its territorial dept. in Ungheny)	To be aware and comment on the environmental impacts of the project	Environmental impacts of the project; public consultation process; Environmental and Social Management Plan	Internal budget and staff	EMM has the main mandate/mission of promoting environmental awareness in the country by promoting environmental education actions. It also participated in the drafting of environmental laws and strategies.	Mun. Chisinau, str. S.Lazo, 13 tel/fax: 0-22-232408; 0-22-237423; tel: 0-22-232654 <a href="http://www.mem.md">http://www.mem.md</a>

Stakeholders	Stakeholder Interest	Perception of the problem/Issues to be discussed	Resources	Mandate in the project's context	Contact data
AGROINFORM, Agricultural producers' National Federation of Moldova	To provide support to the associated farmers which are affected by the project	Impacts related to losses of productive land and agriculture assets	Internal budget and staff	Agroinform is a network of 15 regional organizations that support the sustainable economic development of rural communities by providing complex assistance in business development and marketing, advanced technologies implementation, as well as representing the interests of its members by promoting policies for sustainable rural environment development.	Mun. Chisinau, bd. Stefan cel Mare si Sfint, 123-V fax: 0-22-237830; tel: 0-22-237730 Business association. <a href="http://www.agroinform.md">http://www.agroinform.md</a>
<b>Government</b>					
Ministry of Economy	Project's developer and owner; Recipient of the loan	EIA, Environmental and Social Management Plan, PCDP	Ministry's internal budget and staff; Project loan	The Ministry is responsible for analysis of social and economic position, structure and condition of the production potential of industry, agriculture, energy complex, transport, communication and road infrastructure and other branches of economy; on this basis, development of concepts, strategies and programs for restructuring of economic sectors and social and economic development of the country.	<a href="http://www.mec.gov.md">www.mec.gov.md</a>  Direct contact person for the project: Ms. Mariana Botezatu, Director of the General Department of Energy Security and Efficiency <a href="mailto:mariana.botezatu@mec.gov.md">mariana.botezatu@mec.gov.md</a>

Stakeholders	Stakeholder Interest	Perception of the problem/Issues to be discussed	Resources	Mandate in the project's context	Contact data
MEPIU (Moldova Energy Project Implementation Unit)	Representative of the MoE for the implementation of the project	EIA, Environmental and Social Management Plan, PCDP	World Bank's loan	MEPIU is the key organization in supporting the implementation of Energy II Project from the technical point of view. Upon necessity and within the scope of its competence, the implementation unit is involved by the Ministry of Economy and other public administration institutions in assessment of the long term key developments in the energy sector and in the international cooperation in the field.	<a href="http://www.mepiu.moldnet.md">www.mepiu.moldnet.md</a> <a href="mailto:mepiu@mepiu.md">mepiu@mepiu.md</a>
Ministry of Environment	Its permission or agreement is necessary in order to construct the pipeline.	EIA, Environmental and Social Management Plan, PCDP  Approvals: Application, EIA Program/ToR, EIA Documentation/Report	Ministry's internal budget and staff	The Ministry of Environment shall coordinate the process of environmental impact assessment of the planned facilities and businesses with substantial effect on the environment.	<a href="http://www.medi.gov.md">www.medi.gov.md</a>
Ministry of Agriculture and Food Industry	Its permission or agreement is necessary in order to locate the pipeline on "Ghidighici", on Didactic Station territories (Gratiesti administrative unit) of the State Agrarian University of Moldova, and on the National College of Viticulture and Winemaking territories in Stauceni administrative unit.  <i>The involvement of this ministry in the EIA process shall be a decision of the Ministry of Environment</i>	EIA, Environmental and Social Management Plan, PCDP	Ministry's internal budget and staff	The Ministry of Agriculture shall promote a rational use of the natural resources and environmental protection, arrangement of works for land and forestry cadastre, land monitoring, implementation of uniform policy for land management and control over the land use.	<a href="http://www.maia.gov.md">www.maia.gov.md</a>

Stakeholders	Stakeholder Interest	Perception of the problem/Issues to be discussed	Resources	Mandate in the project's context	Contact data
State Ecological Inspection	<p>The Inspection shall assure the fulfillment of the EIA process with the EIA Law</p> <p><i>The involvement of this agency in the EIA process shall be a decision of the Ministry of Environment</i></p>	EIA, Environmental and Social Management Plan, PCDP	Agency's internal budget and staff	The agency exercises the state control and supervision over compliance with valid legislation and regulations in environmental protection and use of the natural resources by economic operators of any type of ownership and subordination, including the foreign ones.	<a href="http://inseco.gov.md/">http://inseco.gov.md/</a>
Agency Moldsilva	<p>Its permission or agreement is necessary in order to locate the pipeline on forest lands owned by the State and managed by its subdivisions.</p> <p><i>The involvement of this agency in the EIA process shall be a decision of the Ministry of Environment</i></p>	EIA, Environmental and Social Management Plan, PCDP	Agency's internal budget and staff	The general task of the Agency is to implement the constitutional prerogatives and international ratified obligations of the Republic of Moldova on development, promotion and implementation of its policy in forestry and hunting.	<a href="http://www.moldsilva.gov.md">www.moldsilva.gov.md</a>
Agency Apele Moldovei	<p>Its permission or agreement is necessary in order to locate the pipeline on aquatic lands, river protection strips and protected areas of the rivers.</p> <p><i>The involvement of this agency in the EIA process shall be a decision of the Ministry of Environment</i></p>	EIA, Environmental and Social Management Plan, PCDP	Agency's internal budget and staff	Agency "Apele Moldovei" is the administrative authority responsible for implementing state policy in the field of water resources management, hydrological, water supply and sanitation, which operates under the Ministry of Environment.	<a href="http://www.apelemoldovei.gov.md">www.apelemoldovei.gov.md</a>
Ungheni Region Council ( <i>Consiliul Raional Ungheni</i> )	Located in the project area	EIA, Environmental and Social Management Plan, PCDP	Internal budget and staff	The Tier-1 and Tier-2 governments give orders in accordance with the law on implementation of public consultations on the projects of local importance, which can have economic, environmental and social consequences (for life of the	<a href="http://www.crungheni.md">www.crungheni.md</a>
Calasari Region Council ( <i>Consiliul Raional Calasari</i> )		Disclosure of project's information			<a href="http://www.calarasi.md">www.calarasi.md</a>
Straseni Region					<a href="http://www.straseni.md">www.straseni.md</a>



Stakeholders	Stakeholder Interest	Perception of the problem/Issues to be discussed	Resources	Mandate in the project's context	Contact data
Council ( <i>Consiliul Raional Strasenii</i> )		Public consultation: collection of comments and questions; forward these to the MoEn or the developer; support in organization of public debates		people, for culture, health and social protection for local communities and public services), as well as on other issues which are of interest for all population of the administrative-territory unit or its part.	<a href="http://www.nisporeni.md">www.nisporeni.md</a>
Chisinau Region Council ( <i>Consiliul Raional Chisinau</i> )					<a href="http://www.chisinau.md">www.chisinau.md</a>
Tier - 1 (local) governments of the project area					Please consult the list of Tier-1 governments in the project area in Annex 4
Private sector					
Media	Publication of information about the EIA process  Publication of mandatory advertisements related to the project (about the EIA Program, the draft EIA and the public debates)	Disclosure of project's information	Communication platforms (TV, radio, internet and newspapers)	The national, regional and local media fulfill the communication needs of the project.	A list of the media existent in the project area can be found in Annex 5

## 6. Information disclosure and consultation methods

The present PCDP describes the following main points:

- what information will be disclosed;
- in which formats will the information be presented;
- which methods will be used to communicate this information to each of the stakeholder groups;
- which methods will be used to consult with each of the stakeholder groups;
- how the results of the process will be captured, recorded, tracked, and disseminated.

This Section presents different types of information disclosure and consultation methods that are planned to be applied for the project area. Discussions with the MoE, the MEPIU, the Working Group, the MoEn and the IFIs have been undertaken in order for the engagement schedule and platforms to be agreed upon.

### 6.1 Information Disclosure

Disclosure is a formal-sounding term for making information accessible to stakeholders. Information is critical to the effective participation of affected citizens near the project. An informed public will better understand the trade-offs between project benefits and disadvantages; be able to contribute meaningfully to project design; and have greater trust in its new corporate neighbors. Communicating such information in a manner that is understandable to the stakeholders is an important first (and ongoing) step in the process of stakeholder engagement (IFC 2007; IFC 1998). Good practice principles in what concerns information disclosure are:

- Early disclosure: in order for the engagement process to be efficient, the disclosure of information about the project shall be undertaken early in the planning schedule, that is, before the decision-making has been finally undertaken and any impacts have been delivered. Only this way it is possible to include the stakeholders' visions and opinions on the decisions concerning the project.
- Disclose objective information: as far as possible, inform the stakeholders about numbers and facts (even if preliminary), so to avoid the creation of false expectations or unnecessary alarm.
- Design disclosure to support consultation: crucially, leave sufficient time between the provision of information about the benefits and disadvantages of the project (or changes to project operations and their implications) and the start of consultations.

- Provide meaningful information - transmit the information in a manner that is culturally adequate to the targeted public. Consider the local language, the access to information media, the literacy levels, etc.
- Ensure the accessibility of information - adapt the disclosure techniques to the targeted public.

The requirements of the Moldovan law (namely the Law No. 86 of 29<sup>th</sup> of May 2014 on EIA) and of the international financing institutions (EBRD and EIB) in respect to information disclosure principles and scheduling follow the above listed principles, which are in addition considered for the present PCDP. Three phases are considered for the planning of the information disclosure activities:

1. EIA preparation (Section 6.1.1);
2. Construction (Section 6.1.2);
3. Operation (Section 6.1.3).

#### 6.1.1 Disclosure of information during the EIA preparation

The disclosure of information about the Ungheni-Chisinau gas pipeline during the preparation of the EIA consists of the following actions:

1. Notification of the project to the authorities and respective public disclosure;
2. Disclosure of the results of the preliminary assessment of the planned activities;
3. Disclosure of the EIA Program/ToR;
4. Disclosure of the draft EIA Report/EIA Documentation and respective Executive Summary.

##### **1. Notification of the project to the authorities and respective public disclosure**

*Situation for the project: the notification has been delivered and the public has been informed thereof.*

The project's initiator (MoE) submitted a written application ("Application regarding planned activities") to the competent authority (MoEn), which posted information on this respect on its official webpage within 5 days (article 7(1) of the Law Nr. 86) (Annex 1).

The application contained information about the planned activities and at least two (alternative) solutions as to the location and employed technologies, specifying possible environmental impacts and social and economic aspects of such impacts (article 8(1) of the Law Nr. 86).

##### **2. Disclosure of the results of the preliminary assessment of the planned activities**

*Situation for the project: the preliminary assessment has been disclosed.*

After receiving the Application, the MoEn reviewed it and issued its opinion on whether an EIA should be undertaken for the project, as well as on the type of EIA to be prepared (national or transboundary). The MoEn initially considered that a transboundary EIA would be necessary. This opinion or “Preliminary Assessment of planned activities” was disclosed to:

- The project’s initiator (MoE);
- The general public by publication on the MoEn’s website;
- The Romanian Government.

After receiving the Application, the Romanian authorities decided not to participate in the EIA process. This implied that the project is subject to a national EIA procedure. The MoEn disclosed a second Preliminary Assessment stating this fact (Annex 2) to:

- The project’s initiator (MoE);
- The general public by publication on the MoEn’s website;
- The tier-2 governments concerned.

### **3. Disclosure of the EIA Program/ToR for the EIA**

*Situation for the project: the draft EIA Program has been disclosed.*

One important stage of the EIA process is the definition of its scope, that is, the preparation of the Terms of Reference for the future works (or the EIA Program, following article 19 of the EIA Law). That has been done through a process internationally known as “Scoping”.

The EIA ToR/Program sets out the EIA requirements (legal, regulatory, according to the client’s requirements and following international standards), defines the framework for the EIA to meet these requirements, and details the overall project objectives and proposed activities. Based on the EIA requirements, objectives and likely high-level sensitivities, the ToR defines the methodology to be employed in completing the EIA. The overview approach of the scoping phase has highlighted at an early stage potential environmental and social issues that need to be addressed in the subsequent stages, together with any key issues that should be considered at an early stage. More information on this matter can be consulted in the EIA Report.

The draft ToR/Program for the Ungheni-Chisinau gas pipeline EIA has been disclosed to the affected and interested parties for comments as follows:

- a. Information of the public (national requirement): the developer published in newspapers summaries of the planned activities, specifying its official web-page and/or another address where one could get familiar with the EIA ToR/Program. Comments could be submitted to the developer and copies thereof to the competent authority.

- b. Information of the public (international requirement): the IFIs require the developer to publicly disclose the ToR/Program for the EIA. The disclosure process shall be meaningful and performed early in the process. This has been undertaken as shown in the previous point a.
- c. Information of the public (additional measures): hard copies of the draft EIA Program have been made available for public access. This was made at a Tier-2 or district level, i.e, one hard copy of the draft EIA Program was delivered to each local government affected by the project. In addition, the draft EIA Program/ToR was e-mailed to the district councils (tier-2 level authorities) with the request for distribution to the tier-1 level authorities (villages). None of these measures are predicted in the EIA Law, but have been agreed upon.
- d. Information of the authorities (national requirement): the developer submitted to the competent authority for coordination the draft Program/ToR for approval.

#### **4. Disclosure of the draft EIA and respective Executive Summary**

*Situation for the project: to be undertaken.*

The Draft EIA and a Non-Technical Executive Summary will be made publicly available and open to comments as per the national law. The detailed procedure must be as follows:

- Information of the authorities (national requirements): the developer shall submit the draft environmental impact assessment documentation for review to:
  - the competent authority, which has 60 days to review it;
  - the specialized central public authorities and tier-one local government in the project area, which have 50 days to review it.
- Information of the public (national requirements):
  - the competent authority which received the draft EIA shall post it on its official web-page;
  - the local government shall, within five days following receipt of the draft EIA, post it in a publicly available venue, inform thereof the developer, the competent authority, and the public, and provide information about the person helping the developer to organize public debates (for information on public debates please refer to Section 6.2.2).
  - the developer shall:
    - post the draft EIA on its official web-page or ensure public access to it by other means;
    - have an announcement published in at least one national and one local newspaper about it being possible for the public to get familiar with the environmental impact assessment documentation, submit written comments thereto in the period of thirty days, and attend public debates regarding the above documentation;
    - organize public debates where the draft EIA is disclosed.

- Information of the public (international requirements): the IFIs require that the information about the project is disclosed to the public in an on-going basis, including during strategic decision-making points and before any impacts are delivered. This includes the disclosure of the draft EIA.

### 6.1.2 Disclosure of information during construction

For the communities located near the project sites the effects of noise, dust, vibration, traffic, and lighting associated with construction, as well as the presence of the sites themselves, can cause disturbances and stress, as well as pose a physical or health hazard. In addition, social conflicts with the workers may also arise in these villages. To avoid such situations, whether for large capital works or minor construction activities, it is advised to give the public notification of:

- the purpose and nature of the construction activities;
- the start date and duration of the overall construction works and of specific operations (blasting, terrain clearing, transport of heavy components, etc.);
- potential impacts;
- information on whom to contact if there are concerns/complaints related to the contractor.

Also recommended is the regular disclosure of information related to the management of the environmental and social matters (application of measures, monitoring efforts and results).

An important component of information disclosure during construction is the answer to grievances. This is the project's phase where more grievances are expected to be received and the contractor shall be ready to answer to them on time and efficiently. Please refer to Section 7 for guidance on the preparation of a grievance mechanism.

### 6.1.3 Disclosure of information during operation

Typically during operation the number of grievances and frequency of engagement with stakeholders may decrease, along with a reduction in the overall employee and contractor workforce. The following shall be undertaken in this phase for the project:

- a) In case the operator of the pipeline prepares an Emergency Preparedness and Response Plan, this shall be disclosed to the employees and communities so that all stakeholders likely to be affected have a basic understanding of the risks involved and what the key elements of the plan are; and that individuals from within and outside the project know what their allocated roles and responsibilities are during an emergency. Disclose any important changes made to the Plan.

- b) Undertake a regular communication of the company's environmental and social performance;
- c) Maintain the grievance mechanism - there should always be a well functioning procedure for answering public concerns whenever they may arise throughout the life of the project.

#### 6.1.4 Platforms for disclosure of information

Several platforms can be used for disclosure of information, and there is not a one-size-fits-all approach. Each project and respective stakeholders have particularities that make them more or less open or suited for certain platforms than for others. The key characteristics of the project area force an adaptation of the communication's strategy. However, it shall not be forgotten that the target of the information is not only the locally affected villagers, but also the governmental authorities and national associations with interest in the project. This implies that several of the identified stakeholders have access to technologies or platforms that others don't.

The following sections suggest information disclosure platforms for the project adapted to the project area and the national and international requirements. Discussions with the MoE, the MEPIU, the Working Group, the MoEn and the IFIs have been undertaken to agree on the most adequate disclosure platforms.

##### **Media - Newspapers and radio**

As identified in the previous section, advertisements have been and will be placed in newspapers in the following phases:

- EIA Program/ToR phase: presenting the summary of the EIA Program/ToR and giving instructions on how the general public can comment on it (article 19(3) of the Law No. 86); this has been already undertaken for the project (Annex 3).
- EIA Documentation/Report phase: presenting the draft EIA and giving instructions on how the general public can comment on it and participate in public debates (article 21(4) of the Law No. 86).

The newspaper advertisements did/will not include the complete documents (draft EIA Program and draft EIA Documentation), but instead a brief project info and indication of a website where the complete documents can be consulted.

According to the Law No. 86 on EIA, the placement of advertisements in the media will be scheduled for not less than 10 days prior to each public consultation meeting.

The Ministry of Economy shall consider hiring the specialized support of a Community Liaison Officer (CLO) to prepare the press releases and

advertisements, promptly answer the journalists' questions and provide continuing clarification (Section 9.1.1).

Also the broadcast media can be used as a mean to disclose the time and place of public consultation meetings to be held, although this possibility is not mentioned in the EIA Law. Local radio stations can be an effective media to reach rural workers and the less educated segments of the communities.

### **Media - Internet**

As identified in the previous section, information has been/will be placed in the web pages of the developer and the authorities, and will be sent electronically as follows:

- The responsible authority (MoEn) posted information on the filing of the application by the initiator on its official webpage (Annex 1);
- The MoEn posted the decision on the final Preliminary Assessment on its official webpage (Annex 2);
- The developer (MoE) published on the MEPIU's website the summary of the EIA Program/ToR and the instructions on how the general public can comment on it and participate in public debates (<http://www.mepiu.md/eng/future-projects-1.html>);
- The MoE distributed electronically to the district councils (tier-2 level authorities) a copy of the draft EIA Program/ToR with the request for distribution to the tier-1 level authorities (villages) in the project area;
- The MoE and the MoEn will publish the draft EIA on their website;

The MoE's or MEPIU's website shall have a contact window through which questions and/or grievances can be forwarded. The website's address and contact window shall always be disclosed during the public consultation meetings (please refer to the Grievance Redress Mechanism in Section 7).

### **Public placement of hard copies of the project documents**

Although not clearly stated in the national EIA Law, it has been agreed in discussions with the MoE, the MEPIU, the Working Group, the MoEn and the IFIs that hard copies of the draft EIA Program would be made available for public access. This was made at a Tier-2 (district) level, i.e, one copy of the draft EIA Program was delivered at the governmental building of each of the districts affected by the project.

In a later stage of the consultation process, the draft EIA Report/Documentation will be deposited by the local governments (Tier-1 level) in publicly accessible venues (article 21(3) of the EIA Law). These venues shall be chosen taking into consideration transportation costs, the time allowed for viewing the documents, and the timing of access (e.g. at weekends). Locations might include:

- Municipal and central government offices;
- Public libraries;
- Local community centers;



- Local universities or academic research centers;
- Company offices;
- Offices of local NGOs and community-based organizations.

In each of these locations, forms shall be placed near the documents to allow the persons to write their comments to the draft EIA Report. These forms shall be then placed inside closed boxes and collected at the end of the consultation period. The forms shall give the possibility to present the comments anonymously.

#### **Disclosure during surveys**

The preparation of the EIA implied a socio-economic baseline survey, during which 150 inhabitants of the project area have been interviewed. During the interviews information about the project has been disclosed. This has been used as an opportunity to directly clarify the potentially affected and interested persons about the project, its impacts, and the ways they can participate on the consultation process.

#### **Presentations during public consultation meetings/public debates**

As identified in the previous section, public debates will be organized in order to, among others, disclose the project reports.

Planned public consultation meetings will serve not only as a mean of dialogue with stakeholders (please refer to Section 6.2) but also as an opportunity to disclose information about the project and its environmental and social implications, measures and timeline.

## **6.2 Public Consultation**

Consultation is a process of deliberation, discussion and dialogue. It is more than just disclosing information, although clear, transparent and timely information is the basis for any consultation process. The objective of the consultation is also to seek feedback, advice and opinion of the stakeholders in order to shape the project, to the extent possible, to their needs and concerns. In this sense, the vulnerable groups shall be given a particular chance of having their voice heard.

EBRD and EIB require that the client undertakes a process of meaningful consultation in a manner that provides the interested and affected parties with opportunities to express their views on project risks, impacts, and mitigation measures, and allows the client to consider and respond to them. Meaningful consultation is the one that:

- is based on the disclosure of relevant and adequate information including, where appropriate and relevant, draft documents and plans, prior to decisions being taken when options are still open;
- is undertaken early in the environmental and social appraisal process;

- focus on the social and environmental risks and adverse impacts, and the proposed measures and actions to address these;
- is carried out on an ongoing basis as the nature of issues, impacts and opportunities evolves;
- is undertaken in a manner that is inclusive and culturally appropriate, i.e., tailored to the language preferences of the affected parties, their decision-making process, and the needs of any disadvantaged or vulnerable groups;
- is free of external manipulation, interference, coercion or intimidation;
- reports back in a timely way to those consulted.

The requirements of the Moldovan law (namely the Law No. 86 of 29<sup>th</sup> of May 2014 on EIA) and of the international financing institutions (EBRD and EIB) in respect to public consultation principles and scheduling follow the above listed principles, which are in addition considered for the present PCDP. Three phases are considered for the planning of the consultation activities:

1. EIA preparation (Section 6.2.2);
2. Construction (Section 6.2.3);
3. Operation (Section 6.2.3).

## 6.2.1 Techniques for Public Consultation

There is a vast amount of reference literature and tool kits detailing the variety of participatory techniques and methodologies that can be employed as part of the stakeholder engagement process. However, as is the case with most aspects of the process, the choice of methods will depend on the aim of the consultation, the nature of those being consulted (language, literacy, location, exposure to issues), and the timescale/resources available. Using more than one method yields better responses - in quality and quantity. Different methods can also produce different results (IFC, 2007; ADB, 2012).

Table 6-1 presents some of the techniques that are commonly used for undertaking Public Consultation during an EIA process.

**Table 6-1: Different techniques for undertaking Public Consultation (ADB, 2012)**

Technique	Description
Online and Written Consultation	This typically involves using a specific consultation web page to introduce the policy, strategy, or project and the aim of the consultation. The consultation structure varies. A draft document, broad topics, or open-ended questions can be used to guide comments or a survey style with closed questions. Public

	comments allow discussion between stakeholders. Social media can be used. Online consultation enables open public consultation, but it only reaches those who are literate and with internet access, and therefore not the most disadvantaged. Written feedback posted or e-mailed is also common.
Public Meeting	Meetings are an open accessible method of consulting with the public. They take place at any level (community, regional, national, etc.). Ensure they are fully accessible and give adequate notice to interested bodies. Also the meeting size affects participation. Groups of fewer than 20 people ensure everyone can speak. Breakout sessions and participatory methodologies (e.g., ranking, diagrams) can help capture all viewpoints.
Workshop	Workshops involve gathering a group to gain their feedback in a structured format. The face-to-face format allows for brainstorming and testing ideas. Preferable to a single workshop, a series produces greater output. Try different workshop types (e.g., open space, write shop, participatory methods). Facilitation is important, and a skilled neutral individual can help ensure group rules are clear, views are taken seriously, and no participant dominates.
Focus Group Discussion (FGD)	Semi-structured qualitative discussions with a small homogenous group (generally 5–12 participants plus 1–2 skilled facilitators). Open discussion explores people's attitudes, concerns, and preferences toward a specific issue, with the range of viewpoints collated at the end. The mix of people depends on the purpose but numbers are typically restricted to 15 or fewer. Community members not used to formal meetings may feel more comfortable expressing themselves in a FGD (e.g., women, ethnic minorities, or disadvantaged groups; the disabled; or poor individuals and households).
In-Depth Interview	Qualitative phone or face-to-face interviews with individuals (e.g., community members, key informants, or civil society leaders) can get a sense of stakeholders' perspectives. They can be structured (formal, and closely following a written interview guide), semi-structured (partially directed by an interview guide, but open and conversational to allow interviewees to introduce other topics of interest), or unstructured (organized around a few general questions or topics, but informal and open-ended) depending on the context. Structured interviews are likely to yield information that can be compared and generalized, while less structured ones can explore an issue in depth and permit related issues to be raised. Interviews with key informants possessing particular knowledge of an issue are especially useful.
Survey	Surveys provide specific responses on certain issues. They can rapidly show who is interested and why and provide quantitative data. They indicate the weight of different views. Conduct surveys by post, online, or face to face.

### 6.2.2 Public Consultation during the EIA preparation

Public consultations about the Ungheni-Chisinau gas pipeline project during the preparation of the EIA will consist/consisted of the following three actions:

1. Public meetings/debates;
2. Online and written consultation;
3. On site surveys.

### **Public consultation meetings/debates**

*Situation for the project: not yet undertaken.*

Public meetings (or debates, as referred to in the Law No. 86) shall be planned and undertaken by the Ministry of Economy during the EIA preparation phase to present its ongoing results and obtain feedback from the stakeholders concerning its content and the areas which may require more attention. Following the national legal requirements, public debates will be undertaken to present the draft EIA Report/Documentation.

According to article 22(2) of the national EIA Law, the public debates shall be conducted in the territory of the local public authority (tier-1 level or villages) where the planned activity is to be implemented. Considering that there are 30 villages affected by the project, Fichtner considers that undertaking public debates only in selected villages or in the districts is a more efficient and less time and resource consuming way of undertaking public consultation. The adverts and venues of the public debates shall be easily accessible to all villages affected.

The selection of the venues and dates for the meetings shall take into consideration the local characteristics (roads, size of the venues, public transportation means, resting days) and the target public (possession of own transportation means, working schedule). The best option is to select a venue that all affected persons can easily reach. Free transportation shall be provided in the cases where it is necessary.

#### **Before the meetings (Law Nr. 86)**

Before these sessions take place, publicity of the time and place of meetings will be made by the project's initiator following the national requirements, i.e., by putting out adverts in the mass-media or posting them on its official web-page. The local governments shall also post the advert regarding the conduct of public debates on their web-page, at their offices and in other public places. The advert shall be put out no sooner than 10 days before launching the public debates (article 22(3) of the EIA Law).

#### **During the meetings**

The meetings will be structured in two parts: presentation and Q&A (questions and answers).

The first part will consist of a presentation of the Ministry of Economy's operations in the area of gas pipelines development, the Ungheni-Chisinau project and the EIA process. This will be supported with audiovisual resources (slides, pictures, videos) and will use straightforward, non-technical language. The second part of the meetings will consist of an open Q&A session and will be coordinated in order to allow all stakeholders present to manifest their opinion.

A written record of all stakeholder grievances, criticisms and/or suggestions will be undertaken. Further to voiced manifestations, stakeholders will have

the option to register their written opinion in a book to be made available until the end of the meeting.

*After the meetings (Law Nr. 86)*

The findings of the public debates shall be entered in a minute, with the indication of the total number of participants, the list of questions and the objections and proposals put forth during the public debates. The minute shall be drawn up within 3 days following the date of the conduct of the public debates and shall be signed by the chairperson (article 22(4) of the EIA Law).

Should no answers be provided to the questions put forth during the conduct of the public debates, the developer shall deliver the answers within 15 days following the date of the conduct of the public debates to the authors on the postal or email addresses indicated during registration (article 22(5) of the EIA Law).

**Online and written consultation**

*Situation for the project: undertaken for the EIA Program/ToR. Not yet undertaken for the EIA Report/Documentation.*

The public had access to the draft EIA Program and will have access to the draft EIA Documentation, with the possibility to deliver written comments. Following the national regulations and other agreements made with the national authorities and the developer, this has been/will be undertaken as follows:

- Comments to the draft EIA ToR/Program: the public had the possibility to comment on this document through:
  - the official web-page of the developer and the MEPIU where this was made available; the developer announced this possibility in newspapers;
  - the consultation of a hard copy of the document in the building of the Tier-2 (district) authorities in the project area.
- Comments to the draft EIA and the draft Non-Technical Executive Summary: the public will have the possibility to comment on these documents as follows:
  - Through the official web-page of the Ministry of Environment;
  - Through a publicly available venue where the local government shall, within five days following receipt of the draft EIA, place it;
  - Through the official web-page of the developer where the draft EIA will be made available (or other means that the developer considers more feasible); the developer shall announce this possibility in at least one national and one local newspaper; the submission of written comments shall be made in the period of thirty days after the public assess has been granted.

In each of the public venues where the documents will be placed, forms shall be made available near the documents to allow the persons to write

their comments. These forms shall be then placed inside closed boxes and collected at the end of the consultation period. The forms shall give the possibility to present the comments anonymously.

#### **On site surveys**

A socio-economic survey has been undertaken during the EIA process. Besides questioning the affected people about their subsistence means, social and economic activities, demography, cultural habits, etc., their opinion in relation to the project was also investigated.

This survey gave the opportunity for the people to state whether they agree or disagree with the project, which advantages and impacts are they expecting and which measures could be undertaking for enhancing the benefits and minimizing the negative impacts of the project. Details about the results of this survey can be consulted in the EIA Report.

### **6.2.3 Public Consultation during construction and operation**

In the construction and operational phases, it is not a common procedure to undertake public debates, surveys and discussions. Instead, the respective construction and operation contractors shall keep functioning grievance mechanisms. This way it is possible for the interested and affected parties to make complaints or suggestions in relation to the project's activities.

## **6.3 Documentation**

Keeping track of the “who, what, when, and where” of consultation is key to effective implementation of the process. Any commitments made to stakeholders should also be recorded. Careful documentation can help to demonstrate to stakeholders that their views have been incorporated into the project strategies, and is a useful resource for reporting back to stakeholders on how their concerns have been addressed. For this, a Stakeholder Log has been developed and maintained. The Log records:

- stakeholder organization;
- contact details;
- issues and concerns raised;
- actions for follow-up;
- responsibilities and deadline;
- confirmation of close-out.

Please refer to Annex 6 for the Stakeholder Log for this project.

Stakeholder consultation carried out during the course of the early stages of the EIA studies and on the draft EIA Report will be recorded in the final EIA report. This will include:

- The location and dates of meetings, workshops, and discussions;

- A description of the project-affected parties and other stakeholders consulted;
- Presentations and communications;
- The minute of the sessions including:
  - Number of participants;
  - An overview of the issues raised (questions, objections and proposals);
  - How the project sponsor responded to the issues raised;
  - How these responses were conveyed back to those consulted;
- Project variations and impacts on the EIA process;
- Details of outstanding issues and any planned follow-up.

## 7. Grievance Mechanism

A Grievance Mechanism constitutes the system introduced by the promoter that affords all stakeholders, in particular impacted individuals and communities, the ability to provide feedback, channel their concerns, access information and, where relevant, seek recourse and remedy. The access to grievance and remedy should be ensured both for the workers and the public (EIB, 2013). Grievance mechanisms for workers will be separate from public grievance mechanisms (EBRD, 2008).

Ideally, grievance procedures should be in place from the beginning of the social and environmental assessment process and exist throughout construction and operation until the end of the project life. The promoter will duly inform workers and community members of the existence of the grievance mechanism (EIB, 2013).

This Section presents the grievance mechanism for the general public and the workers planned for the Ungheni-Chisinau pipeline project.

### 7.1 General public grievance mechanism

The same way as for the information disclosure and consultation procedures, also the grievance procedures shall be readily understandable, accessible and culturally appropriate for the local population. It shall not be overly complicated to use nor should it require legal counsel to complete. The EIB's Environmental and Social Handbook (2013) states the desired characteristics of the grievance mechanism for the projects it finances:

- legitimate and trusted;
- scaled to the risks and potential adverse impacts of the project;
- publicized and accessible, appropriately tailored to all potentially-affected persons and communities and other interested parties, irrespectively of their literacy and administrative capacity;
- free of cost for the stakeholders;
- includes the anonymity option, where feasible, and guarantee confidential handling of requests, if so requested by the complainant;
- fair, transparent and inclusive;
- guided by engagement and dialogue;
- predictable in terms of process;
- timely appropriate;
- not impeding access to grievance and resolution on grounds of one's financial ability to seek judicial remedy; and,
- a source of continuous learning for the promoter and the lending operation at large.

The project's grievance procedures shall be put into writing, publicized, and explained to relevant stakeholder groups during the implementation of this PCDDP. Several procedures for allowing the register of grievances for the Ungheni-Chisinau gas pipeline project are suggested as follows:



- Nomination of a Community Liaison Officer (CLO) by the MEPIU: a direct contact person for receiving and answering to grievances shall be nominated by the MEPIU and the stakeholders shall be informed thereof.
- Suggestion boxes: These shall be placed in public locations such as libraries, the developer's offices, local government buildings and also in the venues where the public consultation meetings take place.
- Visible billboards: Especially during construction and operation, the respective contractors shall prepare billboards with contact information for sending of grievances (name of the person in charge, telephone, fax, address and e-mail address, web page).
- The developer's webpage (MoE and MEPIU): there shall be a visible link for register of grievances for the general public.

It is good practice for a company to publicly commit to a certain time frame in which all recorded complaints will be responded to and to ensure this response time is enforced. During critical time periods, such as construction, it is important to have an immediate response to time-sensitive complaints. In general all grievances shall be answered in the maximum of 48 hours.

A record shall be kept of all complaints, as well as of the answer given to those. The record should contain:

- the name of the individual or organization (if the grievance has not been made anonymously);
- the date and nature of the complaint;
- any follow-up actions taken;
- the final result; and
- how and when this decision was communicated to the complainant.

Annex 7 presents an example of the public grievances form that shall be made available in the developer's webpage and next to the suggestion boxes.

## **7.2 Workers grievance mechanism**

The construction contractor is requested to implement an independent grievance management system to enable the workers (and their organizations, where they exist) to raise reasonable workplace concerns. This includes complaints related to non-compliance with health & safety matters, discrimination cases and non-consideration of equal opportunities.

The workers grievance mechanism shall follow the same principles as the one created for the general public: complaints must be answered in a timely and effective manner without fear of retribution; the access to the grievance mechanism shall not replace or impede the subsequent access to other

redress mechanisms; the promoter will inform workers of the grievance mechanism at the time of hire and make it accessible to them (EIB, 2013).

The grievance management system shall consider the possibility to contact directly a member of the Site Management Staff. The contacted staff members must take a note of the reported complaint or non-compliance and must report it to the Site Manager.

The Site Manager is requested to solve the complaint or non-compliance within 3 working days. In case the problem cannot be solved an action procedure specifying the needed activities together with a predicted deadline for resolution of the problem must be prepared and submitted to the general manager.

The contractor is requested to provide as well the possibility for the workers to notify a complaint or non-compliance in a confidential way.

## 8. Timetable

It is not practical, and usually not necessary, to engage with all stakeholder groups with the same level of intensity all of the time. For example, some stakeholders will be more affected by a particular phase of a project, such as construction activities. For others, it is important to be engaged before the construction takes place, such as for the people who have to be compensated for losses of land or agricultural assets.

Table 8-1 presents a preliminary schedule for the engagement of stakeholders during the EIA Process. This schedule shall be continuously updated. Table 8-2 shows the schedule for the stakeholder engagement activities to be undertaken during construction and operation.

**Table 8-1: EIA Timetable, including the Stakeholder Engagement Schedule**

Activity type	Objective	Associated law or standard	Platforms or techniques	Content	Date
<b><i>Undertaken activities:</i></b>					
<b>During the disclosure of the project plans and the preliminary assessment</b>					
Submission to the authorities	The MoE shall submit the project plans to the competent authority (MoEn)	Law Nr. 86 on EIA, Article 7 (1)	Official letter	Application regarding planned activities	Undertaken in 13.02.2105
Disclosure of information	The MoEn shall publicly disclose that a project application has been filed	Law Nr. 86 on EIA, Article 7 (2)	Official web-page of the competent authority (MoEn) <a href="http://mediu.gov.md/index.php/activitate/evaluarea-impactului">http://mediu.gov.md/index.php/activitate/evaluarea-impactului</a>	Name of the developer Title of the project Information that an application has been submitted	Within 5 days following the filing of the application  Undertaken in 17.02.15
Authorities' assessment	The MoEn shall assess the need and nature of an EIA for the project	Law Nr. 86 on EIA, Article 9	Internal platforms of the MoEn	Preliminary Assessment of the planned activities	Undertaken in 20.02.15
Disclosure of information	The MoEn shall publicly disclose the initial findings of the Preliminary Assessment	Law Nr. 86 on EIA, Article 10 (2)	Official web-page of the competent authority (MoEn) <a href="http://mediu.gov.md/images/Evaluarea/nr.4%20din%2020.02.2015.pdf">http://mediu.gov.md/images/Evaluarea/nr.4%20din%2020.02.2015.pdf</a>	Findings of the preliminary assessment - need for a transboundary EIA	Within 5 business days of the preliminary assessment  Undertaken in 25.02.15
Disclosure of information - transboundary context	The MoEn shall inform the Romanian authorities of the initial findings of the preliminary assessment	Law Nr. 86 on EIA, Article 12	Official letter	Findings of the preliminary assessment - need for a transboundary EIA Request of participation of Romania in the EIA process	Undertaken in end of February 2015
Disclosure of information	The MoEn shall publicly disclose the final findings of the Preliminary Assessment	Law Nr. 86 on EIA, Article 10 (2)	Official web-page of the competent authority (MoEn) <a href="http://mediu.gov.md/images/Evaluarea/Decizia%20Nr.%209.PDF#page=1&amp;zoom=auto,-76,840">http://mediu.gov.md/images/Evaluarea/Decizia%20Nr.%209.PDF#page=1&amp;zoom=auto,-76,840</a>	Findings of the preliminary assessment - need for a national level EIA	Within 5 business days of the preliminary assessment  Undertaken in 04.03.15

Activity type	Objective	Associated law or standard	Platforms or techniques	Content	Date
<b>During the preparation of the EIA ToR/Program</b>					
Elaboration of report	The MoE shall elaborate the draft EIA ToR/Program	Law Nr. 86 on EIA, Articles 19 (2) and 19 (5) EBRD PR 10 EIB ESS 10	Internal platforms of the Consultant/MoE Meetings with authorities Literature review Collection of GIS data	Draft EIA ToR/Program	Undertaken in 13.03.15
Disclosure of information	The MoE shall disclose the draft EIA ToR/Program to the public	Law Nr. 86 on EIA, Article 19 (3)	National newspaper(s) Local newspaper(s) Official web-page of the developer (MoE) Hard copies available in district (tier-2) government buildings Soft copies sent to local governments (tier-1)	Draft EIA ToR/Program Brief information about the project's activities Deadline for comments	Undertaken in 20.03.15 and 27.03.15
Public Consultation	The MoE shall allow public comments on the draft EIA ToR/Program	Law Nr. 86 on EIA, Article 19 (3)	Online consultation (through web page of the developer) Written consultation (per letter)	Draft EIA ToR/Program Brief information about the project's activities	Undertaken between 20.03.15 and 18.05.15
Submission to the authorities	The MoE shall submit the draft EIA ToR/Program to the competent authority (MoEn)	Law Nr. 86 on EIA, Article 19 (4)	Letter E-mail	Draft EIA ToR/Program	Undertaken in 25.03.15
Authorities' assessment	The MoEn shall make comments on/approve the draft EIA ToR/Program	Law Nr. 86 on EIA, Article 19 (4)	Internal platforms of the authorities	Draft EIA ToR/Program	Undertaken between 20.03.15 and 18.05.15
Elaboration of report	The MoE shall elaborate the final EIA ToR/Program after receiving the comments from the public and the authorities	Law Nr. 86 on EIA, Article 19 (4)	Internal platforms of the Consultant/MoE	Final EIA ToR/Program (this document)	Undertaken in 19.05.15

Activity type	Objective	Associated law or standard	Platforms or techniques	Content	Date
Disclosure of information	The MoE shall disclose the Final EIA ToR/Program to the competent authority, informing also about the public engagement process	Law Nr. 86 on EIA, Article 19 (4)	Letter E-mail	Final EIA ToR/Program (this document)  Materials confirming that the public has been informed	Undertaken in 19.05.15

#### During the preparation of the EIA Documentation/Report

Elaboration of report	The Consulting Engineer (Fichtner) shall elaborate the draft EIA Documentation/Report and the Non-Technical Executive Summary on behalf of the MoE	Law Nr. 86 on EIA, Article 20  EBRD PR 1  EIB ESS 1	Internal platforms of the Consulting Engineer  Site surveys  Meetings with authorities  Literature review  Collection of GIS data  Impact assessment	Draft EIA Documentation/Report and Non-Technical Executive Summary	Undertaken in 20.07.15
Review of report	The MoE and the IFIs shall review the draft EIA Documentation/Report and the Non-Technical Executive Summary; the Consultant shall prepare the Draft Final EIA Documentation/Report and the Non-Technical Executive Summary according to the review.	--	Internal platforms of the Consulting Engineer , the MoE and the IFIs	Draft Final EIA Documentation/Report and Non-Technical Executive Summary	Undertaken in 26.12.15 (English version) and 12.01.16 (Romanian version)

#### **Planned activities:**

Activity type	Objective	Associated law or standard	Platforms or techniques	Content	Date
Review of report	The MoE and the IFIs shall review the draft EIA Documentation/Report and the Non-Technical Executive Summary before its public disclosure; the Consultant shall prepare the Draft Final EIA Documentation/Report and the Non-Technical Executive Summary according to the review	--	Internal platforms of the MoE and the IFIs	Draft Final EIA Documentation/Report and Non-Technical Executive Summary (ready for public disclosure)	Predicted for 29.01.16
Submission to the authorities	The MoE shall submit the draft Final EIA Documentation/Report and the Non-Technical Executive Summary to the competent authority (MoEn), the specialized central public authorities and the tier-one local governments	Law Nr. 86 on EIA, Articles 21 (1) and 21 (2)	Letter E-mail	Draft Final EIA Documentation/Report and Non-Technical Executive Summary	Predicted for 01.02.16
Disclosure of information - national procedure	The MoE, the MoEn and the local governments shall publicly disclose the draft Final EIA Documentation/Report and the Non-Technical Executive Summary	Law Nr. 86 on EIA, Articles 21 (1), 21 (3) and 21 (4)	National newspaper(s) Local newspaper(s) Official web-page of the developer Official web-page of the competent authority Placement in a public venue	Draft Final EIA Documentation/Report and Non-Technical Executive Summary  Brief information about the project's activities  Deadline for comments  Information about public debates	Predicted for 01.02.16
Disclosure of information - IFIs' procedure	The IFIs shall publicly disclose the draft Final EIA Documentation/Report and the Non-Technical Executive Summary	EBRD PR 10 EIB ESS 10	Official web-page of the IFIs	Draft Final EIA Documentation/Report and Non-Technical Executive Summary	Predicted for 01.02.16

Activity type	Objective	Associated law or standard	Platforms or techniques	Content	Date
Public Consultation-national procedure	The MoE shall allow public comments on the draft Final EIA Documentation/Report and the Non-Technical Executive Summary	Law Nr. 86 on EIA, Article 21 (4)	Online consultation (through web pages of the developer and the competent authority)  Written consultation (per letter)	Draft Final EIA Documentation/Report and Non-Technical Executive Summary  Brief information about the project's activities	30 days after public disclosure of the report  Predicted for between 01.02.16 and 01.03.16
Public Consultation-IFIs' procedure	The IFIs shall allow public comments on the draft Final EIA Documentation/Report and the Non-Technical Executive Summary	EBRD PR 10  EIB ESS 10	Online consultation (through web pages of the IFIs)	Draft Final EIA Documentation/Report and Non-Technical Executive Summary	Maximum of 120 days after public disclosure of the report  Predicted for between 01.02.15 and 30.05.16
Disclosure of information	The MoE shall invite stakeholders for the presentation of the draft Final EIA Documentation/Report and the Non-Technical Executive Summary	Law Nr. 86 on EIA, Article 22 (3)	Mass media (newspapers and radio)  Official web-page of the developer  Official web-page of the district governments	Invitation, date and location of the session  Updated brief information about the project	No more than 10 days before the public debate  Predicted for 01.02.16
Public Consultation	The MoE shall publicly present and obtain feedback on the draft Final EIA Documentation/Report and the Non-Technical Executive Summary	Law Nr. 86 on EIA, Article 22	Public Consultation Meeting/Public Debate	The developer's operations in the area of gas pipelines  Brief information about the project's activities  Draft Final EIA and Non-Technical Executive Summary  Audio-visual resources	Predicted for between 01.02.16 and 01.03.16
Elaboration of report	The MoE shall elaborate the Public Participation Report	Law Nr. 86 on EIA, Article 23 (5) and Appendix 7	Internal platforms of the Consultant/Developer  Results of the public consultation process	Public Participation Report	50 days after public disclosure of the report  Predicted for 21.03.16



Activity type	Objective	Associated law or standard	Platforms or techniques	Content	Date
Authorities' assessment	The specialized central public authorities and the tier-one local governments shall make comments on the draft Final EIA Documentation/Report and the Non-Technical Executive Summary	Law Nr. 86 on EIA, Article 21 (2)	Internal platforms of the authorities	Draft Final EIA Documentation/Report and the Non-Technical Executive Summary	50 days after disclosure of the report to the authorities  Predicted for between 01.02.16 and 21.13.16
Authorities' assessment	The competent authority (MoEn) shall make comments on/approve the draft Final EIA Documentation/Report and the Non-Technical Executive Summary	Law Nr. 86 on EIA, Article 21 (1)	Internal platforms of the MoEn	Draft Final EIA Documentation/Report and the Non-Technical Executive Summary including Public Participation Report	60 days after disclosure of the report to the authorities  Predicted for between 01.02.16 and 01.04.16
Decision on the issuance of the Environmental Permit	The competent authority (MoEn) shall decide on the issuance or not of an Environmental Permit based on the draft Final EIA Documentation/Report and the Non-Technical Executive Summary	Law Nr. 86 on EIA, Article 23 (5)	Internal platforms of the MoEn	Reasoning of the decision  Mandatory measures to prevent and reduce impacts  Information regarding the public consultation process	60 days after disclosure of the report to the authorities **  Predicted for 01.04.16
Elaboration of report	The MoE shall elaborate the Final EIA Documentation/Report and the Non-Technical Executive Summary based on the comments received from the MoE, in case a permit has not been obtained	Law Nr. 86 on EIA, Article 23 (3)	Internal platforms of the Consultant  Consideration of the comments received by the MoE	Final EIA Documentation/Report and the Non-Technical Executive Summary including Public Participation Report	30 days after decision of the authorities on the permit. However, this can only be done after the public consultation process of the IFIs is over.  Predicted for 30.06.16

\* As described in Section 6.2.2, Fichtner recommends that the public debates for presentation of the draft EIA are undertaken at a district level, as long as the villages are properly made aware of the debates and transportation is provided when necessary.

**Table 8-2: Stakeholder Engagement Schedule during construction and operation**

Activity type	Objective	Associated law or standard	Platforms or techniques	Content	Date
<b>During construction</b>					
Disclosure of information	Notify the public of the construction works or a specific construction activity	EBRD PR 10 EIB SS 10	Official web-page of the developer	The purpose and nature of the construction activities	Before construction works start
				The start date and duration of the overall construction works and of specific operations	
				The potential environmental and social impacts	
				Information on whom to contact if there are concerns/complaints related to the contractor	
				Information related to the management of the environmental and social matters (application of measures, monitoring efforts and results).	During construction works
				The results of the grievance mechanism	
Public Consultation	Keep a functioning grievance mechanism	EBRD PR 10 EIB SS 10	Nomination of community liaison personnel Suggestion boxes in public locations Visible billboards Official web-page of the developer	Contact information for sending of grievances Time frame in which all recorded complaints will be responded to	During construction works
<b>During Operation</b>					

Activity type	Objective	Associated law or standard	Platforms or techniques	Content	Date
Disclosure of information	Inform the public of operation related issues (community and occupational health and safety; grievance mechanism; environmental and social monitoring)	EBRD PR 10 EIB SS 10	Official web-page of the developer	Emergency Preparedness and Response Plan, if existent  The project's environmental and social performance reports  The results of the grievance mechanism	Every 3 months during the life-time of the project
Public Consultation	Keep a functioning grievance mechanism	EBRD PR 10 EIB SS 10	Official web-page of the developer  Visible billboards	Contact information for sending of grievances  Time frame in which all recorded complaints will be responded to	During the life-time of the project

## 9. Resources and responsibilities

The implementation of the PCDP will be the result of the work of different actors, namely the developer (MoE), its support unit (MEPIU), the MoEn as the licensing authority, the district and local governments, the contractors (for construction and operation) and the Consulting Engineer. The responsibility to monitor the implementation of the PCDP belongs to the MoE.

This Section presents a review of the responsibilities and allocated resources for implementation of the PCDP.

### 9.1 Developer - MoE

In what regards the PCDP, the following are the responsibilities of the MoE as the project's developer:

- a) Information disclosure activities (Section 6.1):
  - Disclosure to the authorities: submit the Application, the draft EIA Program and the draft EIA Documentation to the MoEn.
  - Disclosure to the public: publish the draft EIA Program and the draft EIA Documentation on its website and the media.
- b) Public Consultation activities (Section 6.2):
  - Reception and management of public comments to the draft EIA Program and the draft EIA Documentation.
  - Organization of public debates in cooperation with the local and district governments.
- c) Review and monitor the PCDP.

#### 9.1.1 MEPIU

The MEPIU (Moldova Energy Project Implementation Unit) reports to the MoE and has the objective of ensuring the effective implementation of projects in the energy sector by administrating, monitoring and coordinating the works according to the requirements of international financial donor organizations.

The MEPIU will support the MoE in the activities a) to c) as described in the previous section. Considering that the public consultation on the EIA process has been brought up for the first time under the new EIA Law, and that this is the first project implemented by the MoE and MEPIU under its dispositions, it is advised that a Community Liaison Officer (CLO) is nominated within this unit.

#### **Community Liaison Officer (CLO)**

The CLO shall be based in the field and be responsible for:

- assisting the MoE/MEPIU on detailed planning of the consultation and disclosure process, including the public debates;
- receiving complaints/grievances and coordinating the responses.

The CLO shall be involved in the preparation of invitations for the public debates, local and national press releases, contacts with stakeholders, and management of the relations with national and regional media.

In addition, the CLO shall work collaboratively with the diverse stakeholder groups to keep them informed of the project's activities, impacts and mitigation measures.

## **9.2 Responsible authority - MoEn**

As the responsible authority for application of the EIA Law, the Ministry of Environment has the following responsibilities within the PCDP:

- a) Information disclosure activities (Section 6.1):
  - Disclosure to the public: disclose that an Application has been filed on its website; publish the Preliminary Assessment and the draft EIA Documentation on its website; inform the NGO's about the Preliminary Assessment.
- b) Receive and consider the public comments on the documents produced.

Besides posting information related to the project documents on its web-site, the MoEn has the responsibility of analyzing and demanding the incorporation, whenever pertinent, of the comments from the public on the process. The comments from the public may be received directly through the MoEn's website or may be forwarded by the MoE and the local governments as a result of their own disclosure obligations.

## **9.3 Contractors**

Within the PCDP, the construction contractors have the following responsibilities:

- a) Information disclosure activities (Section 6.1.2):
  - Inform the public about the construction activities (where, when, what, how, for how long, etc.); inform the public about the environmental management on site; give answer to grievances.

Also the operation contractor has responsibilities towards informing the public:

- b) Information disclosure activities (Section 6.1.3):

- Disclose any existing Emergency Preparedness and Response Plan; regularly communicate the project's/company's environmental and social performance; give answer to grievances.

For both the construction and the operation contractors, the following responsibility in the context of the PCDP is assigned:

- c) Public Consultation activities (Section 6.2.3):
  - Keep functioning grievance mechanisms.

## **9.4 District and local governments**

According to the Law Nr. 86 on EIA and the agreed non-mandatory public disclosure activities to be undertaken for the project, the following are the responsibilities of the district and local governments within the PCDP:

- a) Information disclosure activities (Section 6.1.1):
  - Place one hard copy of the draft EIA Program at the governmental building of each of the districts affected (Tier-2); place the draft EIA Documentation and other info in publicly available venues of each of the villages affected (Tier-1).
- b) Public Consultation activities (Section 6.2.2):
  - Support the MoE in organizing the public debates; collect public comments to the draft documents and forward them to the MoEn.

## **9.5 Consulting Engineer**

The EIA-related documents for the project have been/will be prepared by an external consultant, or Consulting Engineer (CE), in this case Fichtner GmbH & Co. KG. While preparing these documents, the CE supports the MoE in undertaking its information disclosure and public consultation activities.

## 10. Reporting

This Section identifies how and when the results of public consultation and information disclosure will be reported.

### 10.1 During ESIA preparation

#### 10.1.1 Response to comments to the ESIA documents

In order to respond appropriately to comments made by the public on the draft ToR/Program for the EIA and on the draft EIA Report, the authority responsible for revision and approval of these documents (MoEn) shall develop a mechanism for receiving, documenting and addressing the comments submitted. Actions shall include:

- Acknowledging that comments have been received;
- Information of the project developer about the suggestions received, including those to be mandatorily included in the EIA documents, so he can incorporate them into these where appropriate;
- Providing an explanation of why certain comments are not able to be adopted.

The comments received in written form and the response given to them by the responsible authority shall be publicly disclosed at least by means of the public participation report (Section 10.1.2).

#### 10.1.2 Public Participation Report

The Law Nr. 86 on Environmental Impact Assessment states that the project's developer shall prepare a public participation report which shall be an integral part of the EIA Documentation/Report (Article 21). This report shall be generated following the public debates and the written comments received from the stakeholders and general public during the EIA process.

The public participation report shall be submitted to the competent authority within 50 days after the EIA draft report has been presented to the public. The following indicates the content of the report:

1. Planned activity (name, type).
2. Developer of the planned activity (name, legal postal and email address, telephone and fax numbers).
3. The EIA documentation preparer (name, legal postal and email address, telephone and fax numbers).
4. Authority responsible for the notification of the public and/or EIA documentation dissemination.
5. Authority responsible for the enforcement of the public's participation and the receipt of the public's comments (objections), in the event where the authority is not the same as the one mentioned above.

6. Methods for informing the public, venue, time and manner of conduct of the public debates.
7. List of the information sent out to the public at all the stages of the EIA
8. Minutes of the public consultation debates, including the list of participants, the name of the organization (should there be representatives of the organizations) and the issues addressed by the participants.
9. List of objections and proposals regarding the EIA Documentation submitted in written form.
10. The public's objections and proposals, with the indication of the proposals that will be taken into account and of those that will not be taken into account, explaining the decline.

## **10.2 During construction and operation**

As stated in Section 6.2.3 , during construction and operation public debates, surveys and discussions are not undertaken. The public consultation process is as therefore related to the management of grievances.

Section 7 on the project's grievance mechanism states that a record on the management of public grievances shall be kept by the project's developer containing:

- the name of the individual or organization (in case the grievance has not been made anonymously);
- the date and nature of the complaint;
- any follow-up actions taken;
- the final result; and
- how and when this decision was communicated to the complainant.

Following the EIB's Environmental and Social Handbook (2013), the promoter (MoE) will introduce an effective feedback system to the grievance mechanism, informing the affected communities about the grievance process and its outcomes and reporting regularly to the public on its implementation, while protecting the privacy of individuals. In view of this, it is advised that these reports are made publicly available in the developer's official web-page, updating the information every 3 months.



## 11. References

**ADB, 2012:** *Strengthening participation for development results - an Asian Development Bank guide to Participation*, ADB, Philippines, 2012

**EBRD, 2008:** *Environmental and Social Policy*, European Bank for Reconstruction and Development, May 2008

**EIB, 2013:** *Environmental and Social Handbook*, European Investment Bank, December 2013

**Fichtner, 2014:** *Pre-feasibility Report for the Ungheni-Chisinau Natural Gas Pipeline, Final Report*, Fichtner, December 2014

**Fichtner, 2015:** *Inception Scoping Report for the Ungheni-Chisinau Natural Gas Pipeline, Final Report*, Fichtner, January 2015

**Fichtner and IPOT, 2014:** *Pipeline Routing Analysis, Feasibility Study of the Ungheni-Chisinau Natural Gas Pipeline*, Stuttgart, November 2014

**IFC, 1998:** *Doing Better Business through Effective Public Consultation and Disclosure - A Good Practice Manual*, IFC, Washington, D.C., October 1998

**IFC, 2007:** *Stakeholder Engagement: a good practice handbook for companies doing business in emerging markets*, IFC, Washington, D.C., May 2007

## 12. Annexes

### 12.1 Annex 1 - Disclosure of the filing of the Application

**Particip.gov.md**  
Spune-ți părerea, opina te contează!

**GREENEV**  
ACCELERATOR ZIELONYCH TECHNOLOGII

Managementul Poluanților Organici Persistenti

Fondul Național de Date Geospațiale  
Mediul Înconjurător

Sistemul Informațional Geografic al Apei

Unitatea de Implementare Protecție Apă și Canalizare

Baza de date pentru funcționarii publici din Moldova

**Informații generale necesare pentru pregătirea către evaluarea impactului asupra mediului**

[Legea nr. 86 din 29 mai 2014 privind evaluarea impactului asupra mediului](#)  
[Legea nr. 851 din 29 mai 1996 privind expertiza ecologică](#)

[Ordinul ministrului nr. 9 din 10 februarie 2015 cu privire la implementarea capitolului III al Legii nr. 86 din 29 mai 2014 privind evaluarea impactului asupra mediului](#)  
[Ghidul cu privire la executarea procedurilor privind evaluarea impactului asupra mediului](#)  
[Model de scrisoare](#)

**Registrul evaluării prealabile a activității planificate**

Nr.	Numar cerere	Nume solicitant	Informație cerere	Decizie, Notificare
8	341	Carferm SRL	Exploatarea zăcămintelor nisip-prundis "Cetireni II" raionul Ungheni	
7	340	Safari Impex	Valorificarea și recultivarea carierei de nisip pentru construcții	
6	320	Consiliul satesc Radulenii vechi	Construcția segmentului de apeduct de la punctul de racordare la traseul Soroca-Balti pînă la satul Radulenii vechi, raionul Florenți	
5	319	Consiliul satesc Radulenii vechi	Construcția rețelelor satesti de apeduct și canalizare în teritoriul comunei Radulenii vechi, raionul Florenți	
4	309	Ministerul Economiei	Construcția conductei de gaze naturale Ungheni-Chisinau	
3	272	Telemautoservice	Colectarea și prelucrarea deșeurilor din lampi, termometre și baterii uzate care conțin mercur	
2	231	Safari Impex	Valorificarea și recultivarea carierei de nisip	Notificare
1	137, 168	Eurogenetics	Construcția fermei de creștere a porcilor de prasila(400 capete)	DECIZIA nr.03-07/208 din 11.02.2015

<http://mediu.gov.md/index.php/activitate/evaluarea-impactului>

## 12.2 Annex 2 - Preliminary Assessment of the planned activities (second decision after consultation with the Romanian Authorities)

MINISTERUL  
MEDIULUI  
AL REPUBLICII MOLDOVA

MD 2005 mun. Chișinău, str. Cosmonauților 9  
tel. 20-45-07, tel/fax 22-68-58  
E-mail: cgreata@mediu.gov.md



МИНИСТЕРСТВО  
ОКРУЖАЮЩЕЙ СРЕДЫ  
РЕСПУБЛИКИ МОЛДОВА

MD 2005 мун. Кишинэу, ул. Космонавтов 9  
тел. 20-45-07, тел/факс 22-68-58  
E-mail: cgreata@mediu.gov.md

### DECIZIA

evaluării prealabile a activității planificate

Nr. 9 din 04.03.2015

Ca urmare a reexaminării solicitării depuse de Ministerul Economiei, înregistrate cu numărul 309 din 13.02.2015, pentru efectuarea evaluării prealabile a activității planificate "Construcția conductei de gaze naturale Ungheni- Chișinău"

În urma examinării de către Comisia de experți pentru efectuarea evaluării prealabile a activității planificate din cadrul Ministerului Mediului în ședința extraordinară din 02.03.2015

Luînd în considerație prevederile Legii nr. 86 din 29.05.2014 privind evaluarea impactului asupra mediului

#### DECIDE:

Activitatea planificată urmează a fi supusă evaluării impactului asupra mediului la nivel național, reieșind din rezultatul consultării cu partea posibil afectată. În acest context Ministerul Economiei va elabora Programul de realizare a evaluării impactului asupra mediului și-l va coordona cu Ministerul Mediului. Totodată, în procesul elaborării programului, subliniem necesitatea respectării prevederilor art. 19 al Legii nr. 86 din 29.05.2014 privind evaluarea impactului asupra mediului.

Viceministru



Lazăr CHIRICĂ

<http://mediu.gov.md/images/Evaluarea/Decizia%20Nr.%209.PDF#page=1&zoom=auto,-76,840>



## 12.3 Annex 3 - Newspaper announcement of the availability of the draft EIA Program

Programe / Publicitate

**TVR1**

**PRIME**

**LUNI, 6 APRILIE**

7.00 Telegiurnal matinal Sport Meteo 8.55 Andrografia zilei 9.00 Starea nației 9.55 Foc în război 10.50, 15.00 Teleshopping 11.30 Serial: Capri 12.25 Vorbește corect! 12.30 Impact global 13.00 Germania... la 1 14.00 Telegiurnal Sport-Meteo 14.55, 18.30, 20.55 Clubul celor care muncesc în România 15.30 Andrografia zilei 16.55 Opiniile fiscale 17.10 Hai - Hui 18.40 Capri 19.35 Vorbește corect! 19.45 Sport 21.00 Vorbește liber! 22.00 Biziday 22.50 Starea nației 23.50 Magazin UEFA.

**MARTI, 7 APRILIE**

8.55 Andrografia zilei 9.00 Starea nației 10.00 Biziday 10.50, 15.00 Teleshopping 11.30 Serial: Capri 12.25 Vorbește corect! 12.30 Tribuna artidelor parlamentare 13.00 EURO pollis 14.00 Telegiurnal Sport-Meteo 14.55, 18.30, 20.55 Clubul celor care muncesc în România 15.30 Andrografia zilei 16.55 Opiniile fiscale 17.10 Plusuri și minusuri 18.40 Capri 19.35 Vorbește corect! 19.45 Sport 21.00 Vorbește liber! 22.00 Biziday 22.50 Starea nației 23.50 Film: Ultimele zile. Partea I.

**MIERCURI, 8 APRILIE**

7.00 Telegiurnal matinal Sport Meteo 8.55 Andrografia zilei 9.00 Starea nației 10.00 Biziday 10.50, 15.00 Teleshopping 11.30 Capri 12.25 Vorbește corect! 12.30 Europa mea 13.00 Fără tichetă 14.00 Telegiurnal Sport-Meteo 14.55, 18.30, 20.55 Clubul celor care muncesc în România 15.30 Andrografia zilei 16.55 Opiniile fiscale 17.10 Se zice că... 18.40 Capri 19.35 Vorbește corect! 19.45 Sport 21.00 Vorbește liber! 22.00 Biziday 22.50 Starea nației 23.50 Film: Ultimele zile. Partea II - a.

**JOI, 9 APRILIE**

7.00 Telegiurnal matinal Sport Meteo 8.55 Andrografia zilei 9.00 Starea nației 10.00 Biziday 10.50, 15.00 Teleshopping 11.30 Capri 12.25 Vorbește corect! 12.30 Tribuna partidelor parlamentare 13.00 De joi până joi 14.00 Telegiurnal Sport-Meteo 14.55, 18.30, 20.55 Clubul celor care muncesc în România 15.30 Andrografia zilei 16.55 Opiniile fiscale 17.00 Interes general 18.00 Ocul cel mare 18.40 Capri 19.35 Vorbește corect! 19.45 Sport 21.00 Vorbește liber! 22.00 Biziday 22.50 Film: Sherlock Holmes.

**VINERI, 10 APRILIE**

7.00 Telegiurnal matinal Sport Meteo 8.55 Andrografia zilei 9.00 Profesioniști... 10.00 Biziday 10.50, 15.00 Teleshopping 11.30 Capri 12.25 Idevăzuri despre trecut 13.30 M. A. I. aproape e tine 14.00 Telegiurnal Sport-Meteo 14.55, 18.30, 20.55 Clubul celor care muncesc în România 15.30 Oameni ca noi 16.00 Parlamentul românesc 16.55 Opiniile fiscale 17.00 Mașini, aște și verdict 17.30 Prin Țara zănelor 18.00 Iar eu sa fiu sănătos! 18.30 Universul credinței 19.45 Sport 21.10 Film: Miracol în pădure 22.45 Concert.

**SÂMBĂȚĂ, 11 APRILIE**

7.00 În grădina Danei 7.30 Prietenie cu nădădăi 8.00 Albă ca Zăpada 9.30 Mașini, teste și erci 10.00 Zoni@ 10.30 Europa mea 11.00 Concert 11.40 Istoriile de buzunar 11.50 Film: Feța din Chartreuse 13.30 Impact global 14.00 Telegiurnal Sport Meteo 14.30 Vreau sa fiu sănătos! 15.00 Ora regelui 16.00 Dosar Romania 17.00 Film: Charlot vagabond 17.30 Curaj la feminin 18.00 Exclusiv în România 18.50 Telegiurnal Sport 19.45 Sport 20.00 Telegiurnal Meteo

**LUNI, 6 APRILIE**

5.00 "Доброе утро" 7.00 "Prima Ora" 9.00, 12.00, 15.00, 18.00 "Primele stiri" (rom.) 9.10, 12.15, 15.15, 18.20 "Новости 9.20 Teleshopping 9.40 "Жить здорово!" 10.40 "Модный приговор" 11.35 "Фазенда" 12.30 "Сегодня вечером" 14.25 "Смак" 15.35 "Контрольная закупка" 16.00 "Мужское / Женское" 17.10 "Наедине со всеми" 19.00 "Давай поженимся!" 20.00 "Пусть говорят" 21.00 "Primele stiri" (rom.) 21.40 "Время" 22.15 "Фарца".

**MARTI, 7 APRILIE**

5.00 "Доброе утро" 7.00 "Prima Ora" 9.00, 12.00, 15.00, 18.00 "Primele stiri" (rom.) 9.10, 12.15, 15.15, 18.20 "Новости 9.20 Teleshopping 9.40 "Жить здорово!" 10.40 "Модный приговор" 11.35 "Фазенда" 12.30 "Т/с "Фарца" 14.25 "Смак" 15.35 "Контрольная закупка" 16.00 "Мужское / Женское" 17.10 "Наедине со всеми" 19.00 "Давай поженимся!" 20.00 "Пусть говорят" 21.00 "Primele stiri" (rom.) 21.45 "Время" 22.15 "Фарца".

**MIERCURI, 8 APRILIE**

5.00 "Доброе утро" 7.00 "Prima Ora" 9.00, 12.00, 15.00, 18.00 "Primele stiri" (rom.) 9.10, 12.15, 15.15, 18.20 "Новости 9.20 Teleshopping 9.40 "Жить здорово!" 10.40 "Модный приговор" 11.35 "Фазенда" 12.30 "Фарца" 14.25 "Смак" 15.35 "Контрольная закупка" 16.00 "Мужское / Женское" 17.10 "Наедине со всеми" 19.00 "Давай поженимся!" 20.00 "Пусть говорят" 21.00 "Primele stiri" (rom.) 21.45 "Время" 22.15 "Фарца".

**JOI, 9 APRILIE**

5.00 "Доброе утро" 7.00 "Prima Ora" 9.00, 12.00, 15.00, 18.00 "Primele stiri" (rom.) 9.10, 12.15, 15.15, 18.20 "Новости 9.20 Teleshopping 9.40 "Жить здорово!" 10.40 "Модный приговор" 11.35 "Фазенда" 12.30 "Фарца" 14.25 "Смак" 15.35 "Контрольная закупка" 16.00 "Мужское / Женское" 17.10 "Наедине со всеми" 19.00 "Давай поженимся!" 20.00 "Пусть говорят" 21.00 "Primele stiri" (rom.) 21.45 "Время" 22.20 "Фарца".

**VINERI, 10 APRILIE**

5.00 "Доброе утро" 7.00 "Prima Ora" 9.00, 12.00, 15.00, 18.00 "Primele stiri" (rom.) 9.10, 12.15, 15.15, 18.20 "Новости 9.20 Teleshopping 9.40 "Жить здорово!" 10.40 "Модный приговор" 11.35 "Фазенда" 12.30 "Фарца" 14.25 "Смак" 15.35 "Контрольная закупка" 16.00 "Мужское / Женское" 17.05 "Человек и закон" 19.00 "Давай поженимся!" 20.00 "Поне чудес" 21.00 "Primele stiri" (rom.) 21.40 "Время" 22.15 "Достоинство Республики".

**SÂMBĂȚĂ, 11 APRILIE**

6.00, 10.00, 12.10, 15.10, 18.10 "Новости 6.10 "Кио. За кулисами иллюзий" 06.55 X/ф "Угрошение огня" 8.25 "Играй, гармонь любимая!" 9.00 "Умницы и умники" 9.45 "Слово пастыря" 10.15 Teleshopping 10.30 "Смак" 11.05 "Целитель Лука" 12.00, 15.00, 18.00 "Primele stiri" (rom.) 12.20 "Идеальный ремонт" 13.10 "Баракхолка" 13.55, 15.10 X/ф "Афоня" 15.40 Т/с "Красавица" 17.20 "Угадай мелодию" 18.25 "Кто хочет стать миллионером?" 19.20 Коллекция Первого канала 21.00 "Primele stiri" (rom.) 21.20 "Время" 21.55 "Сегодня вечером" 23.30 Пасха Христова.

**ДУМИНЦА, 12 APRILIE**

6.00, 10.00, 12.10, 15.10, 18.15 "Новости 6.10 "Звезда по имени Гагарин" 7.05 X/ф "Угрошение огня" 8.25 "Служу Отчизне!" 8.55 "Здоровье" 10.15 Teleshopping 10.30 "Ненужные заметки" 10.45 "Пока все дома" 11.30 "Фазенда" 12.00, 15.00, 18.00 "Primele stiri" (rom.) 12.20 "Земля в иллюминаторе" 13.15 "Голки" 15.10 "Песни Букки. Будем жить!"

**Proiectul Programului privind Evaluarea Impactului asupra mediului (EIM) "Construcția conductei de gaze naturale Ungheni-Chișinău"**

Ministerul Economiei al RM (Inițiator), cu susținerea financiară a BERD, BEI și a Facilității de Investiții pentru vecinătate UE ("EU NIF"), a inițiat procedura de elaborare a Studiului de fezabilitate privind construcția unei noi conducte de gaze Ungheni-Chișinău.

Scopul proiectului este sporirea siguranței aprovizionării cu energie a țării prin diversificarea surselor de aprovizionare. Proiectul construcției gazoductului magistral Ungheni-Chișinău poate fi considerat ca extensie a gazoductului existent de interconexiune existentă, lângă Ungheni, și va transporta gaze naturale spre Chișinău.

După examinarea "Cererii privind activitățile planificate", Ministerul Mediului, în conformitate cu articolul 19 al Legii nr. 86 din 29.05.2014, a hotărât că "...activitatea planificată urmează a fi supusă evaluării impactului asupra mediului la nivel național...". Totodată, Inițiatorul trebuie să asigure informarea publicului și să ofere posibilitatea acestuia și autorităților publice interesate să prezinte în scris comentarii la program.

Inițiatorul a elaborat și prezintă spre informare proiectul Programului de evaluare a impactului asupra mediului persoanelor și autorităților publice interesate pentru oferirea comentariilor/proponerilor apărute vizavi de proiectul Programului. Comentariile vor fi prezentate Inițiatorului, copie - autorităților competente (Consiliul Raional, Ministerul Mediului etc).

Versiunea electronică a Programului privind EIM poate fi accesată pe paginile electronice: [www.mepiu.md](http://www.mepiu.md) și [www.mec.gov.md](http://www.mec.gov.md)

Datele de contact pentru transmiterea comentariilor către Inițiatorul proiectului sînt:

UCIPE/MEPIU, reprezentant al Ministerului Economiei

Tel, fax: 022496790,

e-mail [mepiu@mepiu.md](mailto:mepiu@mepiu.md)

(Cu mențiunea: "EIM Ungheni-Chișinău")

**MINUNILE TRECUTULUI**

Civilizația egipteană; Petra - ciudat oraș; Minunile universului; Trecut, prezent și viitor; Noua ordine mondială și alte subiecte importante.

Vă invităm la programul uncial "MINUNILE TRECUTULUI".

**Prezentator:** Dr. Sephen Jakovac (arheolog din Australia)

**5-18 aprilie, ora 18:30, local "Patria"**

**Intrarea liberă**

**Telefon:** 076030940; 060967317; 067319153

*Pe 12 aprilie, va avea loc un concert de muzică clasică.*

Figure 12-1: Announcement on the edition of 03.04.2015 of the Expresul (Ungheni)



17.00 Cnatot vagabonu	10.45 Пока все дома	13.25 Азбука вкуса
17.30 Curaj la feminin	11.30 Фазенда	14.20 Последний январь
18.00 Exclusiv în România	12.00, 15.00, 18.00 Primele stiri	15.15 Личное дело
18.50 Teledictpedia	12.20 Земля в иллюминаторе	17.50 Прямой эфир
21.10 Vals în lumina lunii	13.15 Горько!	<b>ПЯТНИЦА</b>
23.00 Aceasta este Calea!	14.05 Теория заговора	06.00 Доброе утро, Страна!
23.45 Universul credinței	15.10 Леонид Быков	08.00 О самом
<b>DUMINICĂ</b>	16.05, 18.35 Коллекция Первого	
07.00 Vreau sa fiu sănătos!	19.00 Replica	

**Proiectul Programului Privind Evaluarea Impactului asupra Mediului (EIM) "Construcția conductei de gaze naturale Ungheni-Chișinău"**

Ministerul Economiei al RM (Inițiator), cu susținerea financiară a BERD, BEI și a Facilității de Investiții pentru Vecinătate UE ("EU NIF"), a inițiat procedura de elaborare a Studiului de fezabilitate privind construcția unei noi conducte de gaze Ungheni-Chișinău.

**Scopul proiectului** este sporirea siguranței aprovizionării cu energie a țării prin diversificarea surselor de aprovizionare.

**Proiectul construcției** gazoductului magistral Ungheni-Chișinău poate fi considerat ca extensie a gazoductului existent de interconexiune dintre România și Republica Moldova (Iași-Ungheni). Noul gazoduct se va racorda la interconexiunea existentă, lângă Ungheni, și va transporta gaze naturale spre Chișinău.

**După examinarea** „Cererii privind activitățile planificate”, Ministerul Mediului, în conformitate cu articolul 19 al Legii nr. 86 din 29.05.2014, a hotărât că „... activitatea planificată urmează a fi supusă evaluării impactului asupra mediului la nivel național...”. Totodată, Inițiatorul trebuie să asigure informarea publicului și să ofere posibilitatea acestuia și autorităților publice interesate să prezinte în scris comentarii la program.

**Inițiatorul a elaborat și prezintă** spre informare proiectul Programului de evaluare a impactului asupra mediului persoanelor și autorităților publice interesate pentru oferirea comentariilor/propunerilor apărute vizavi de proiectul Programului. Comentariile vor fi prezentate Inițiatorului, copie - autorităților competente (Consiliul Raional, Ministerul Mediului, etc.).

Versiunea electronică a Programului privind EIM poate fi accesată pe paginile electronice: **www.mepiu.md și www.mec.gov.md**

**Datele de contact pentru transmiterea comentariilor către Inițiatorul proiectului sunt:**  
 UCIFE/MEPIU, reprezentant al Ministerului Economiei  
 Tel./fax 022496790, e-mail: mepiu@mepiu.md **(cu mențiunea: "EIM Ungheni-Chișinău")**

Figure 12-2: Announcement on the edition of 03.04.2015 of the Unghiu

**ЭКОНОМИЧЕСКОЕ ОБОЗРЕНИЕ**

**Proiectul Programului privind Evaluarea Impactului asupra Mediului (EIM)**  
**«Construcția conductei de gaze naturale Ungheni-Chișinău»**  
 Ministerul Economiei al RM (Inițiator), cu susținerea financiară a BERD, BEI și a Facilității de Investiții pentru Vecinătate UE ("EU NIF"), a inițiat procedura de elaborare a Studiului de fezabilitate privind construcția unei noi conducte de gaze Ungheni-Chișinău.  
 Scopul proiectului este sporirea siguranței aprovizionării cu energie a țării prin diversificarea surselor de aprovizionare.  
 Proiectul construcției gazoductului magistral Ungheni-Chișinău poate fi considerat ca extensie a gazoductului existent de interconexiune dintre România și Republica Moldova (Iași-Ungheni). Noul gazoduct se va racorda la interconexiunea existentă, lângă Ungheni, și va transporta gaze naturale spre Chișinău.  
 După examinarea „Cererii privind activitățile planificate”, Ministerul Mediului, în conformitate cu articolul 19 al Legii nr. 86 din 29.05.2014, a hotărât că „... activitatea planificată urmează a fi supusă evaluării impactului asupra mediului la nivel național...”. Totodată, Inițiatorul trebuie să asigure informarea publicului și să ofere posibilitatea acestuia și autorităților publice interesate să prezinte în scris comentarii la program.  
 Inițiatorul a elaborat și prezintă spre informare proiectul Programului de evaluare a impactului asupra mediului persoanelor și autorităților publice interesate pentru oferirea comentariilor/propunerilor apărute vizavi de proiectul Programului. Comentariile vor fi prezentate Inițiatorului, copie - autorităților competente (Consiliul Raional, Ministerul Mediului, etc.).  
 Versiunea electronică a Programului privind EIM poate fi accesată pe paginile electronice: **www.mepiu.md și www.mec.gov.md**  
 Datele de contact pentru transmiterea comentariilor către Inițiatorul proiectului sunt:  
 UCIFE/MEPIU, reprezentant al Ministerului Economiei,  
 tel/fax 022 49 67 90, e-mail: mepiu@mepiu.md  
 (cu mențiunea: "EIM Ungheni-Chișinău")

**ПРЕСС-РЕЛИЗ**

**Предварительный запуск форума и медийной мастерской «GirlsGoIT»**

В пятницу, 27 марта, состоится предварительный запуск форума и медийной мастерской «GirlsGoIT». Целью программы, партнерами которой выступают «ООН-Женщины», Центр электронного управления, «Novateca», АТЭС и TEKEDU, является укрепление предпринимательских и инновационных способностей путем обучения девушек и женщин в области использования цифровых технологий. В рамках пилотной программы запланированы беседы с приглашенными участниками, которые поделятся своим опытом в области достижения женщиной независимости при помощи информационных технологий. В мероприятии, посвященном пилотному запуску проекта, примут участие представители Правительства,

в Республике Молдова, Майей Саиду, министром просвещения Республики Молдова, Улэнуэну Янсан, директором программы, партнерами которой выступают «ООН-Женщины» в Республике Молдова, Эваном Траком, директором «IREX/Novateca» в Республике Молдова. Кроме того, Министерство образования, Министерства информационных технологий и связи и Всемирная ассоциация неправительственных организаций представят доклады по теме конференции. Мероприятие завершится мастерской, которую проведет «YOPESCO».

В рамках форума и медийной мастерской «GirlsGoIT» будет организован летний лагерь, в котором девушки в возрасте от 16 до 20 лет смогут улучшить свои знания в области информационных технологий под руководством местных и зарубежных экспертов в данной области.

В перспективе планируется

**Operational Department Specialist**

**Responsibilities:**

- Manage and maintain the customer operational system;
- Carry responsibilities of market research for finding better price offers for raw materials/semi-products;
- Ensure good communication with operational department and submit accurate information;
- Prepare documents and arrange transport for company import/exports;
- Execute any other instructions given by the Hierarchical superior.

**Requirements:**

- Experience required: Logistics or commercial experience;
- Education: High education (preferable in Economics);
- Language Skills: Fluency in English, Romanian and Russian, written and spoken;
- Computer Skills: Microsoft Office (especially Excel), good literacy;
- Skills: prioritize effectively and exercise significant attention to details; active work organizing; good communication and teamwork;
- Self-Motivation and Guidance: Determined initiative and self-motivation in handling all assigned tasks.

**What we offer:**

- Attractive salary;
- Nice work environment, the Head Office is located on Stefan cel Mare street, Chisinau;
- Possibility of career development.

Candidates should submit their applications in English with a photo before 18<sup>th</sup> of April 2015 to: [olga.alobozian@missort.com](mailto:olga.alobozian@missort.com)

Only the shortlisted persons will be contacted

Мастерская займется командой обучает набор на вакансию должность

**ТОРГОВОГО ПРЕДСТАВИТЕЛЯ**

Требования:

Figure 12-3: Announcement on the edition of 27.03.2015 of a national newspaper

## 12.4 Annex 4 - Tier-1 governments in the project area

Nr.	Option 1
1	Todiresti
2	Pirlita
3	Alexeevca
4	Radenii Vechi
5	Milesti
6	Temeleuti
7	Valcinet
8	Peticeni
9	Tuzara
10	Niscani
11	Sadova
12	Pitusca
13	Bucovat
14	Vorniceni
15	Capriana
16	Calarasi
17	Panasesti
18	Ghelauza
19	Negresti
20	Roscani
21	Sireti
22	Ghidighici
23	Gratiesti
24	Stauceni
25	Tohatin
26	Straseni
27	Chisinau
28	Radeni
29	Sipoteni
30	Zagarancea

## 12.5 Annex 5 - List of media in the project area

District	TV Channels	Newspapers
Chisinau	<i>No info</i>	<i>No info</i>
Calarasi	<i>No info</i>	Expresul - regional
Straseni	<i>No info</i>	Straseneanca - local
Ungheni	VerTamar	Unghiul - local Expresul - regional
	Gama	
	EuroTV	

## 12.6 Annex 6 - Stakeholder log (as of 01.03.2016)

Entity	Representative	Communication media	Comment	Answer and Action for follow-up	Responsibility	Deadline	Confirmation of close-out
Ecological Inspection of Ungheny	Mr. Vlas Grigore (060600785)	Meeting	<u>Comments to the line routing:</u> Concern on the vicinity of the pipeline with the protected area Plaiul Fagului and possible disturbance of migration routes of birds	The pipeline does not directly cross the reserve, but this issue has been studied in the ESIA.  The nature of the project and the predicted activities do not entail a risk for migration routes of birds, unless there are direct damages to wetlands in the area that might be used by the birds for resting and feeding. This issue has been studied in the ESIA.	Fichtner	20.07.15	Confirm the close-out once the draft EIA is made public.
Regional Council of Ungheny	Yuri Toma, president	Meeting	<u>Comments to the ESIA process:</u> The public consultations shall be arranged on the level of the villages	Public consultation is being made at a national level, by publishing the project documents and other project information in the internet (websites of MEPIU, MoE and MoEn) and in the newspapers. This implies that everyone can have access to the documents and information.  Public debates (to present the draft ESIA Report) will be made at a regional level, because the realization of debates in each of the 30 villages affected would be extremely time consuming and would not fit the overall ESIA schedule.	MoE	NA	Confirm the close-out once the draft EIA and PCDP are made public.
Ecological Inspection of Straseni	Maria (068358762, <a href="mailto:iestraseni@es.gov.md">iestraseni@es.gov.md</a> )	Meeting	No comments	NA	NA	NA	NA



Entity	Representative	Communication media	Comment	Answer and Action for follow-up	Responsibility	Deadline	Confirmation of close-out
Regional Council of Straseni	Syrbu Nikolay, in charge of the communication with the Project (069566654)	Meeting	No comments	NA	NA	NA	NA
Regional Council of Calarasi	Boris Goldberg, chief of the construction department (024422951, 069113223, <a href="mailto:goldberg@mail.ru">goldberg@mail.ru</a> )	E-mail	<u>Comments to the line routing:</u> Near Călărași town the gas pipeline will enter the protection area of the Bîc river (50 m from the river - Law no. 440 of 27.04.1995)	1) The pipeline crosses the protection area of the Bîc river. However, according to the Law no. 440, the gas pipeline is not subject to any interdictions related to this.	Fichtner	20.07.15	Confirm the close-out once the draft final EIA is made public.
			<u>Comments to the line routing:</u> A petrol station is located along the planned route.	The petrol station is at a distance of about 82m from the points 142 and 143 of Option 1. According to the Moldovan technical rules, this is not allowed. Option 1 has been discarded in favor of Option 1b.	Fichtner	20.07.15	Closed - Option 1 has been discarded in favor of Option 1b.
			<u>Comments to the line routing:</u> On the route that is crossing the city of Calarasi, the construction of water supply main Chisinau-Straseni-Calarasi is planned, and IPOT (State Planning Institute for Land Management) performed the works for provisional land allotment for the design and construction of the water supply main, these works being coordinated with all affected landowners from the Straseni and Calarasi districts.	The intention of this comment is not completely clear, but it is assumed that the comment is highlighting the risk of interference between the gas pipeline and the water pipeline project.  As IPOT performed the routing study for the gas pipeline project and was also involved in the water pipeline project, it is assumed that the possible interferences are sufficiently considered.	Fichtner	NA	Confirm the close-out once the draft final EIA is made public.

Entity	Representative	Communication media	Comment	Answer and Action for follow-up	Responsibility	Deadline	Confirmation of close-out
			<u>Comments to the line routing:</u> The planned gas main route bypassing the Calarasi city will either cross terrains with a high risk of land sliding near Niscani village, or will cross forest resources on the slope near Paulesti village.	The bypass around Calarasi (Route 1b) has been inspected by a geotechnical and a pipeline expert. Based on the onsite visual inspection findings, the routing has been refined to avoid eroded areas. In addition, the ESIA predicts a series of measures to avoid and mitigate impacts on soil, including post-construction restoration.	Fichtner	NA	Confirm the close-out once the draft final EIA is made public.
Regional Council of Nisporeni	Savelie Tipa, chief of the construction department (026422088, 069275519)	Meeting	<u>Comments to the line routing:</u> The yellow route [Option 2] goes through a region with landslides	This was taken into account in the variant comparison in the ESIA process. Option 2 has been discarded.	Fichtner	20.07.15	Option 2 has been discarded.
Municipality of Chisinau Primaria	Vladimir Cotet, vice president	Letter	<u>Comments to the draft EIA Program:</u> The Mayoralties of the affected villages should be informed about the project. The EIA Program and the baseline assessment questionnaires should be shared with them. These will then pose questions, comments, make proposals, etc. Affected villages of the Chisinau Municipality: Tohatin, Stauceni, Gratiesti, Ghidighici (Vatra).	There has been a delay in the distribution of the EIA Program to the Chisinau authorities due to difficulties in finding a contact person. Finally, this has been distributed to the Chisinau Primaria.  After receiving these comments from Mr. Cotet, Fichtner delivered the EIA Program (and the baseline assessment questionnaires) to the 4 villages.	Fichtner	NA	The EIA Program has been distributed to the 4 villages.
Village of Stauceni	Cucereanu Igor, Chief Architect	Meeting	<u>Comments to the line routing:</u> Between points 18 and 21 the route may cross a village.	The analysis of the satellite imagery show that no village is crossed between points 18 and 21.	Fichtner	NA	Confirm the close-out once the draft EIA is made public.
Village of Tohatin	Boris Ciuree ( <a href="mailto:primaria@tohatin.md">primaria@tohatin.md</a> , 069142351)	Meeting	No comments	NA	NA	NA	NA

Entity	Representative	Communication media	Comment	Answer and Action for follow-up	Responsibility	Deadline	Confirmation of close-out
Village of Gratiesti	Budec Ion, Architect (069744593) and Alexandr Colomeets, Cadastre Engineer (069243141)	Meeting	No comments	NA	NA	NA	NA
	Andrey Florica, <i>primar</i> (mayor)	Meeting	<u>Comments to the line routing:</u> The pipeline shall preferably cross commune owned land rather than private lands, in order to facilitate the resolution of land related issues	Agriculture is the main economical sector in the project area. At the same time, about 94% of the agricultural land in Moldova is privately owned (EIA Report, Section 7.3.2). Given the above, it was unavoidable to cross private land in the area.	Fichtner	NA	Confirm the close-out once the draft EIA is made public.
Village of Ghidighici	Ion Begelt (0069115619, <a href="mailto:ionbeglet@mail.ru">ionbeglet@mail.ru</a> )	Meeting	No comments	NA	NA	NA	NA
Ministry of Environment	Vice-minister Lazar Chirica	Letter	<u>Comments to the draft EIA Program:</u> Missing information: 1) Time schedule of implementation of the EIA (updated) 2) Confirmation of distribution of the Draft Programmes between Local authorities 3) Comments from Local authorities 4) Confirmation of publications on newspapers	The MEPIU to send the items requested under 2), 3) and 4) to the MoEn  Fichtner to send the updated time schedule for the EIA	MEPIU and Fichtner	Immediately	The information has been sent and the EIA program was approved in 01.06.2015.

## 12.7 Annex 7 - Public Grievances Form

Gender:				
Title:				
Name: <i>(Please do not fill this field if you would like to remain anonymous)</i>				
Please mark how you wish to be contacted	<input type="checkbox"/> Post	<input type="checkbox"/> Telephone	<input type="checkbox"/> E-mail	<input type="checkbox"/> Others
	Address:	Contact number:	E-mail address:	Please specify:
Preferred language for communication	<input type="checkbox"/> Romanian	<input type="checkbox"/> Russian	<input type="checkbox"/> English	<input type="checkbox"/> Others
				Please specify:
Description of Incident or Grievance (What happened? Where did it happen? Who did it happen to? What is the result of the problem?)				
Date of Incident/Grievance:				
<input type="checkbox"/> One time incident/grievance?		Date:		
<input type="checkbox"/> Happened more than once?		How many times?		
<input type="checkbox"/> On-going (currently experiencing problem)				
Do you have suggestions on how to solve the problem?				
<input type="checkbox"/> I request you not to disclose my identity to third parties without my previous written consent				
Signature:				
Local:				
Date:				

## 12.7 Annex 7 - Public Grievances Form

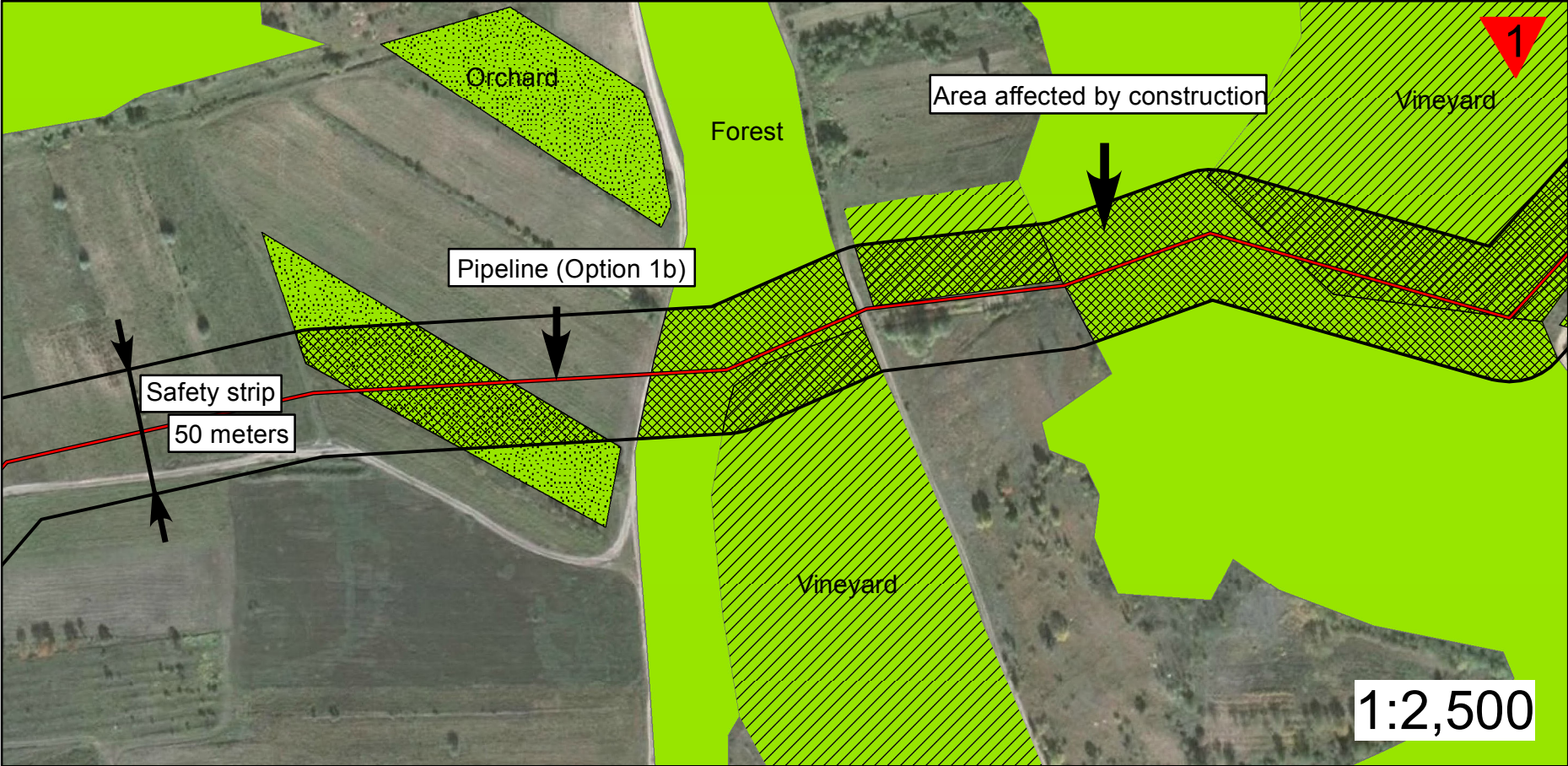
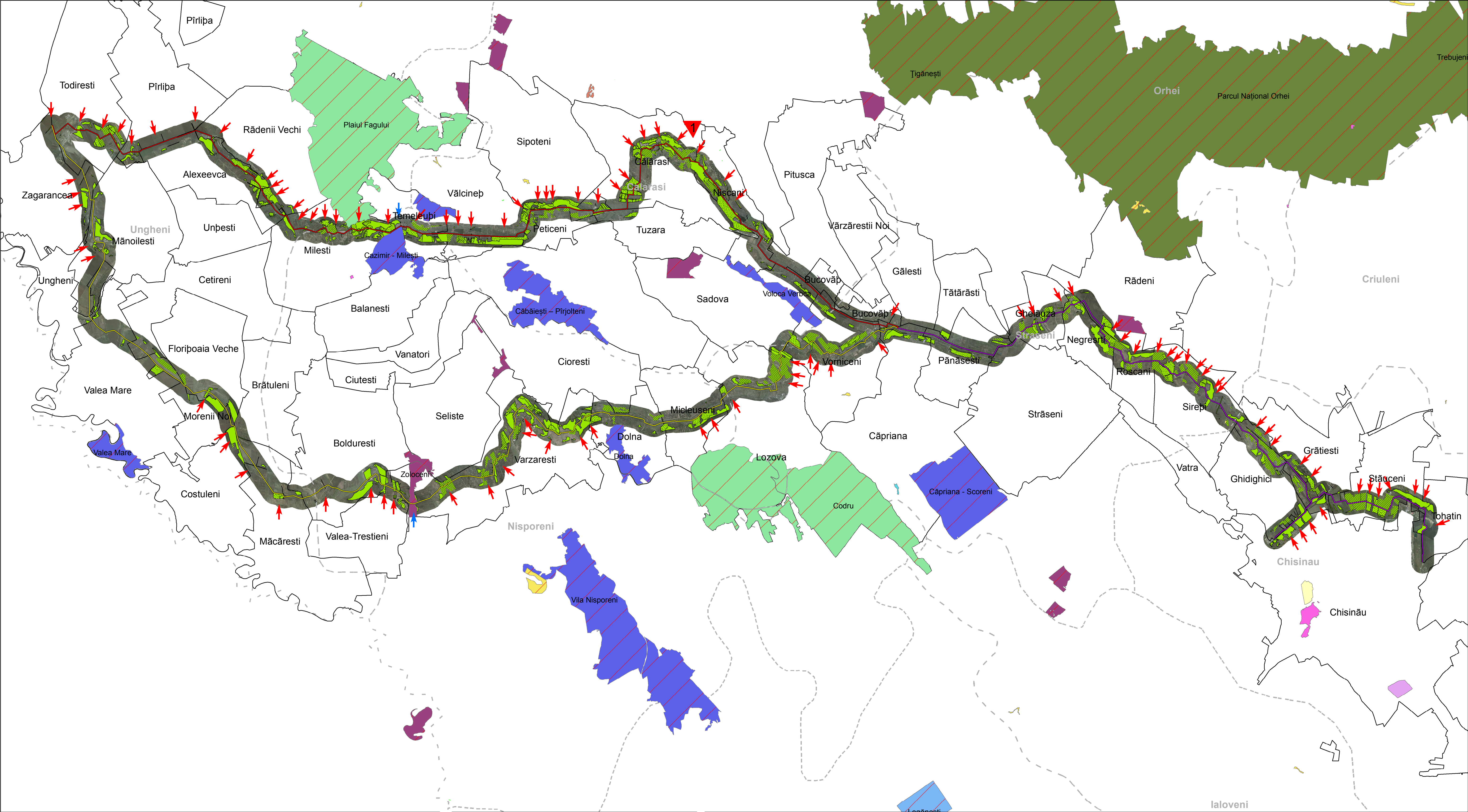
Gender:				
Title:				
Name: <i>(Please do not fill this field if you would like to remain anonymous)</i>				
Please mark how you wish to be contacted	<input type="checkbox"/> Post	<input type="checkbox"/> Telephone	<input type="checkbox"/> E-mail	<input type="checkbox"/> Others
	Address:	Contact number:	E-mail address:	Please specify:
Preferred language for communication	<input type="checkbox"/> Romanian	<input type="checkbox"/> Russian	<input type="checkbox"/> English	<input type="checkbox"/> Others
				Please specify:
Description of Incident or Grievance (What happened? Where did it happen? Who did it happen to? What is the result of the problem?)				
Date of Incident/Grievance:				
<input type="checkbox"/> One time incident/grievance?		Date:		
<input type="checkbox"/> Happened more than once?		How many times?		
<input type="checkbox"/> On-going (currently experiencing problem)				
Do you have suggestions on how to solve the problem?				
<input type="checkbox"/> I request you not to disclose my identity to third parties without my previous written consent				
Signature:				
Local:				
Date:				

## 16.7 Maps

- Map No. 1: Major Biodiversity Values - National Ecological Network of the Republic of Moldova
- Map No. 2: Target Species - National Ecological Network of the Republic of Moldova
- Map No. 3: Ecological Corridors - National Ecological Network of the Republic of Moldova
- Map No. 4: Eroded areas and landslides in the project area and expected areas of impact (erosion enhancement)
- Map No. 5: Agricultural areas in the project area, and expected areas of impact (loss of productivity)
- Map No. 6: Surface water in the project area, and expected areas of impact (crossing, contamination and over usage)
- Map No. 7: Residential areas in the project area, and expected areas of impact (air and noise emissions)
- Map No. 8: Protected and other green areas in the project area, and expected areas of impact (landscape and biological environment)

*Please refer to the separate documents*





**Rationale**  
Several forested areas (protected and non-protected), vineyards and orchards will be crossed by the pipeline, as shown in this map. This implies their removal from the safety strip of 50 meters, causing permanent landscape effects, disturbances to fauna, destruction of flora and disturbances of natural protected areas.

Please refer to Sections 7.1.10, 7.2.1, 7.2.3, 7.2.4, 8.1.1.7, 8.1.2.1, 8.1.2.2 and 8.1.2.3 of the ESIA Report for further details.

This map makes use of red and blue arrows to point the location of the areas of expected negative impact.

In the box, one example is shown of how the impacts of protected and other green areas have been considered for the assessment.

Example  
 Safety strip  
 Area affected by construction

**Legend**

**Protected Areas (source: gismediu)**

- Biological Natural Monuments
- Hydrological Natural Monuments
- Landscape Reserves
- Multifunctional Management Areas
- National Park
- Natural Forest Reserves
- Natural Monument Geology and Paleontology
- Resource Reserves
- Scientific Reserves
- Botanical Garden
- Monument of Landscape Architecture
- Tree Garden
- Herb Natural Reserve

Protected Area according to IUCN classification

**Other Green Areas**

- Forest Areas (source: IPOT)
- Vineyard (source: IPOT)
- Orchard (source: IPOT)

**Expected areas of impact on:**

- Protected Areas
- Other Green Areas

**Options**

- 1b
- 2
- Common Section

Districts Localities

**Fichtner GmbH & Co.KG**  
Sarweystr.3 70191 Stuttgart Germany phone: +49 711 8995-0 fax: +49 711 8995-459 info@fichtner.de

Client: Guvernul Republicii Moldova Ministerul Economiei

**Ungheni - Chisinau Natural Gas Pipeline**

Map No. 8  
Protected and other green areas in the project area, and expected areas of impact (landscape and biological environment)

0 1.5 3 6 9 12 km

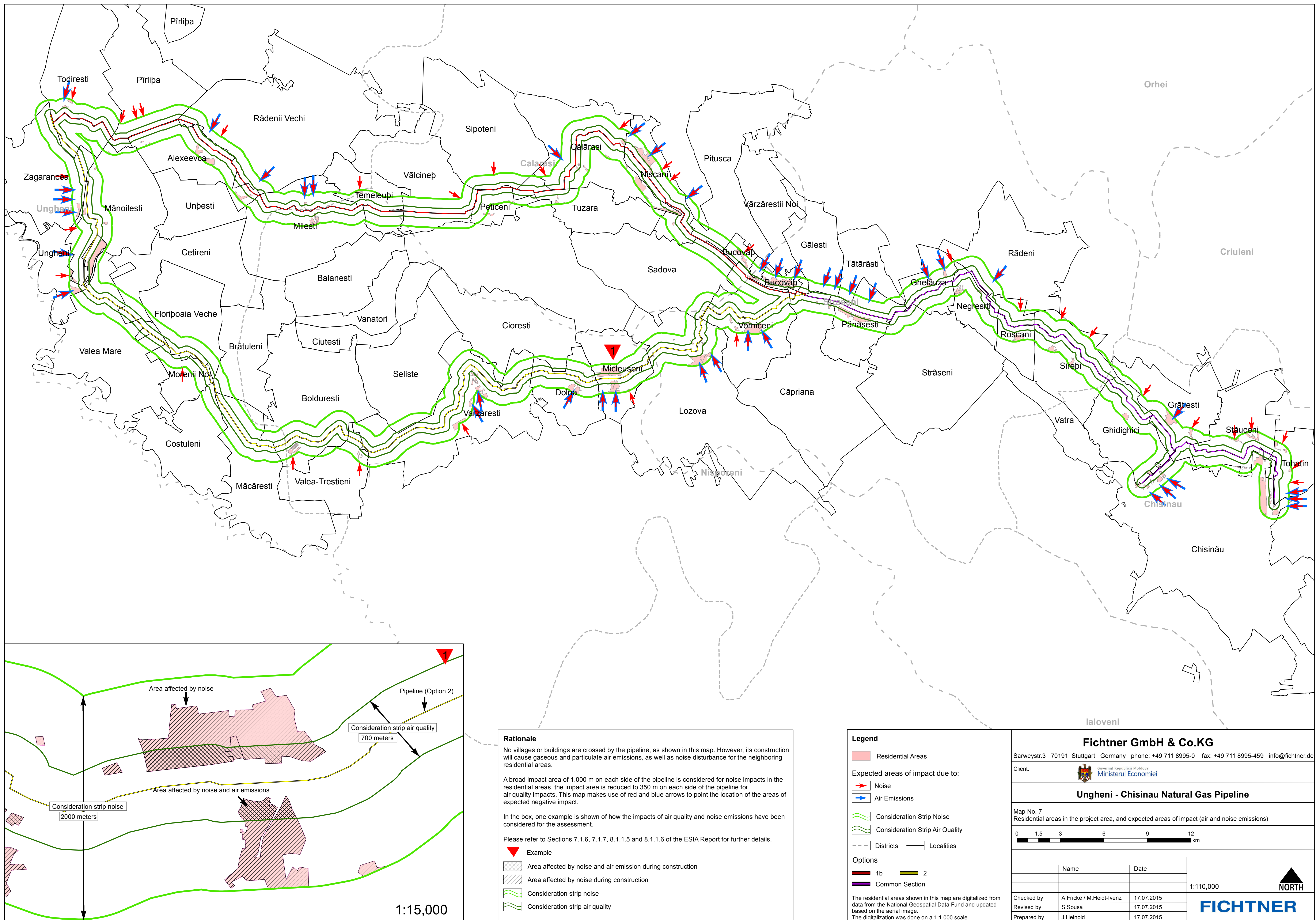
	Name	Date
Checked by	A.Fricke / M.Heidt-Ivenz	17.07.2015
Revised by	S.Sousa	17.07.2015
Prepared by	J.Heinold	17.07.2015

1:110,000

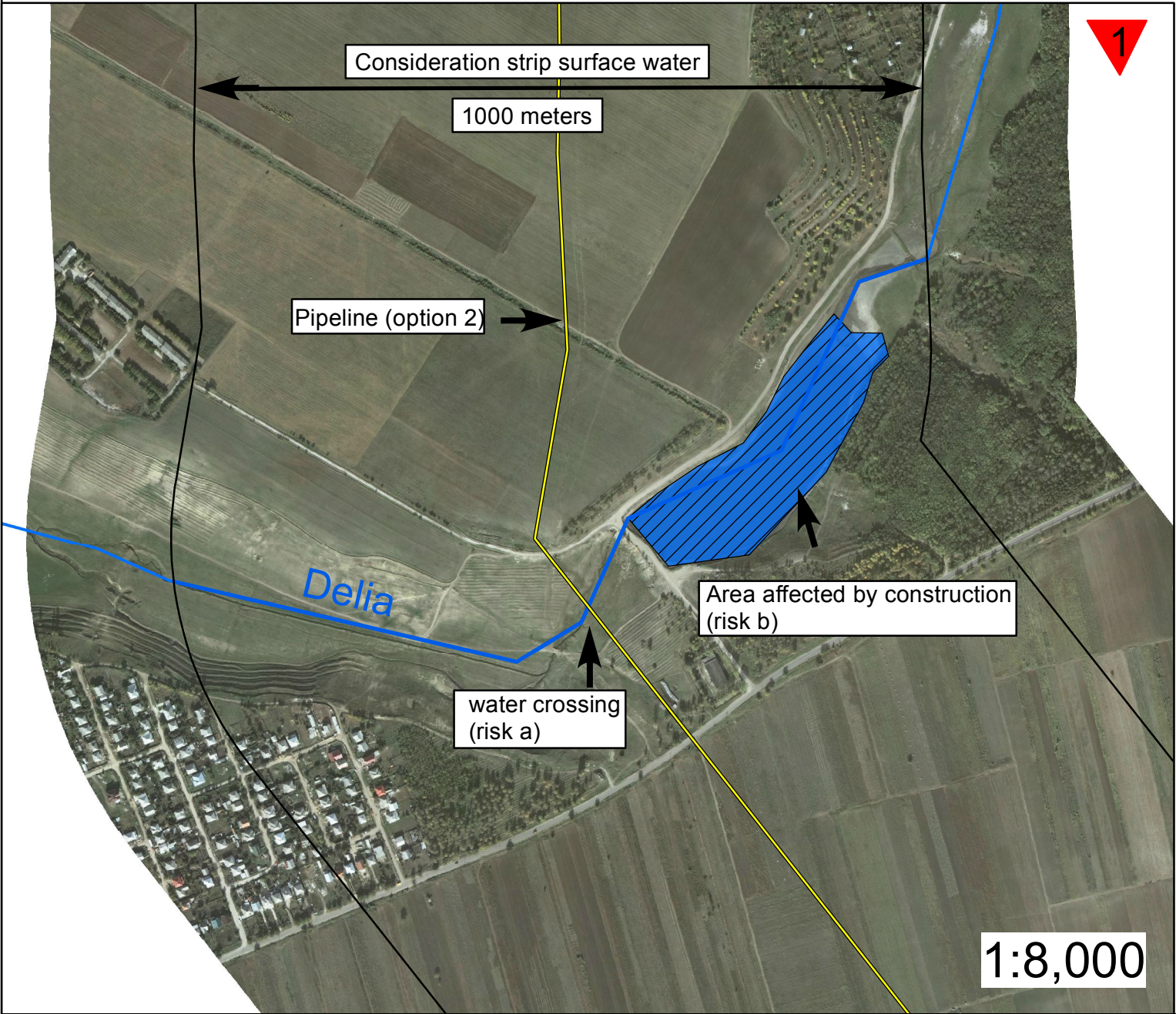
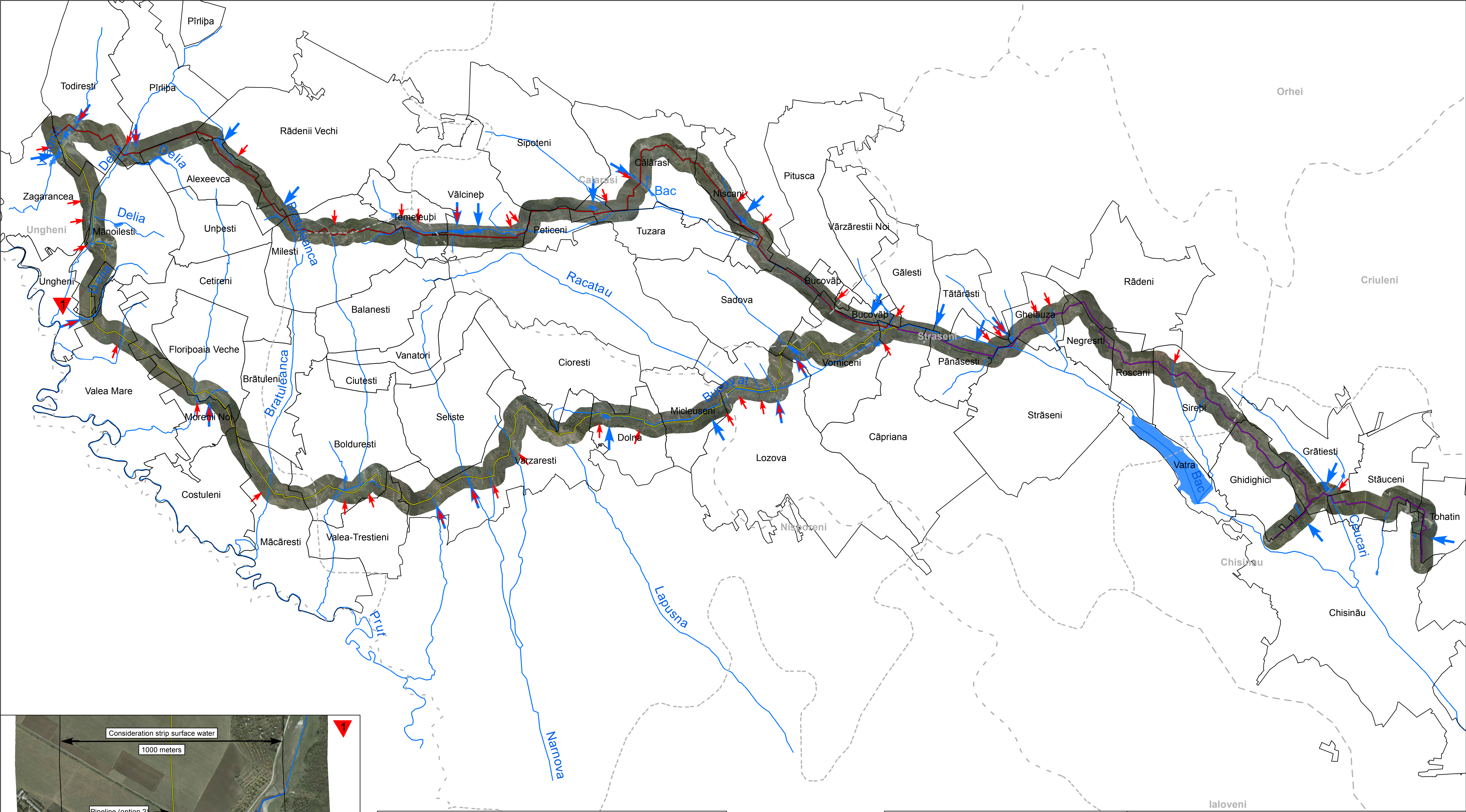
**FICHTNER**

NORTH









**Rationale**

Several aboveground water features are crossed by the pipeline project, or exist in its vicinity: rivers, creeks, artificial lakes, and wetlands (not Ramsar sites). This is shown in this map.


The project may bring two types of risks to the surface water, and consequently also to the aquatic fauna and riparian flora in the area:


a) risks related to crossing: considered whenever a water feature needs to be crossed;  
b) risks of water contamination and over usage (by incorrect disposal, accidental run-off and hydrostatic testing): considered when the construction activities are undertaken less than 500 m away from surface water features.


This map makes use of red and blue arrows to point the location of the areas of expected negative impact.

In the box, one example is shown of how the impacts on surface water have been considered for the assessment. In this case, both risk types (a and b above) are included.


Please refer to Sections 7.1.8 and 8.1.1.4 of the ESIA Report for further details.


 Example

 Consideration Strip surface water


 Area affected by construction


**Legend**


 Rivers, streams, rivulets


 Watersurfaces

Expected areas of impact due to:


 Crossing


 Water contamination and over usage


 Districts

 Localities

**Options**

 1b


 2

 Common Section

The water features shown in this map are digitalized from data from the National Geospatial Data Fund and updated based on the aerial image. This map only shows water features that are crossed or located close by the options.  
The digitalization was done on a 1: 20.000 scale.

**Fichtner GmbH & Co.KG**

Sarweystr.3 70191 Stuttgart Germany phone: +49 711 8995-0 fax: +49 711 8995-459 info@fichtner.de

Client:  Guvernul Republicii Moldova  
Ministerul Economiei


**Ungheni - Chisinau Natural Gas Pipeline**

Map No. 6  
Surface water in the project area, and expected areas of impact (crossing, contamination and over usage)

0 1.5 3 6 9 12 km

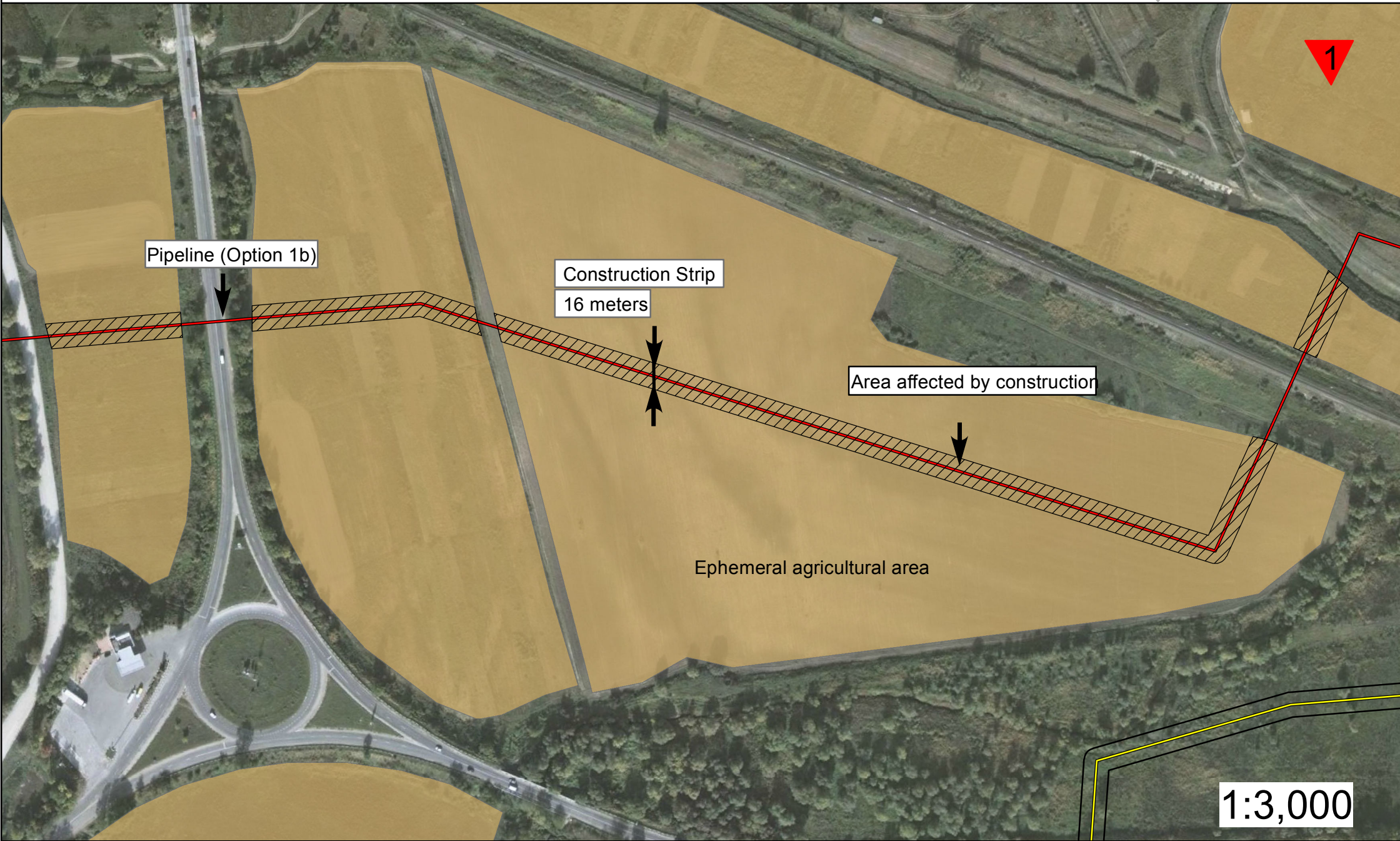
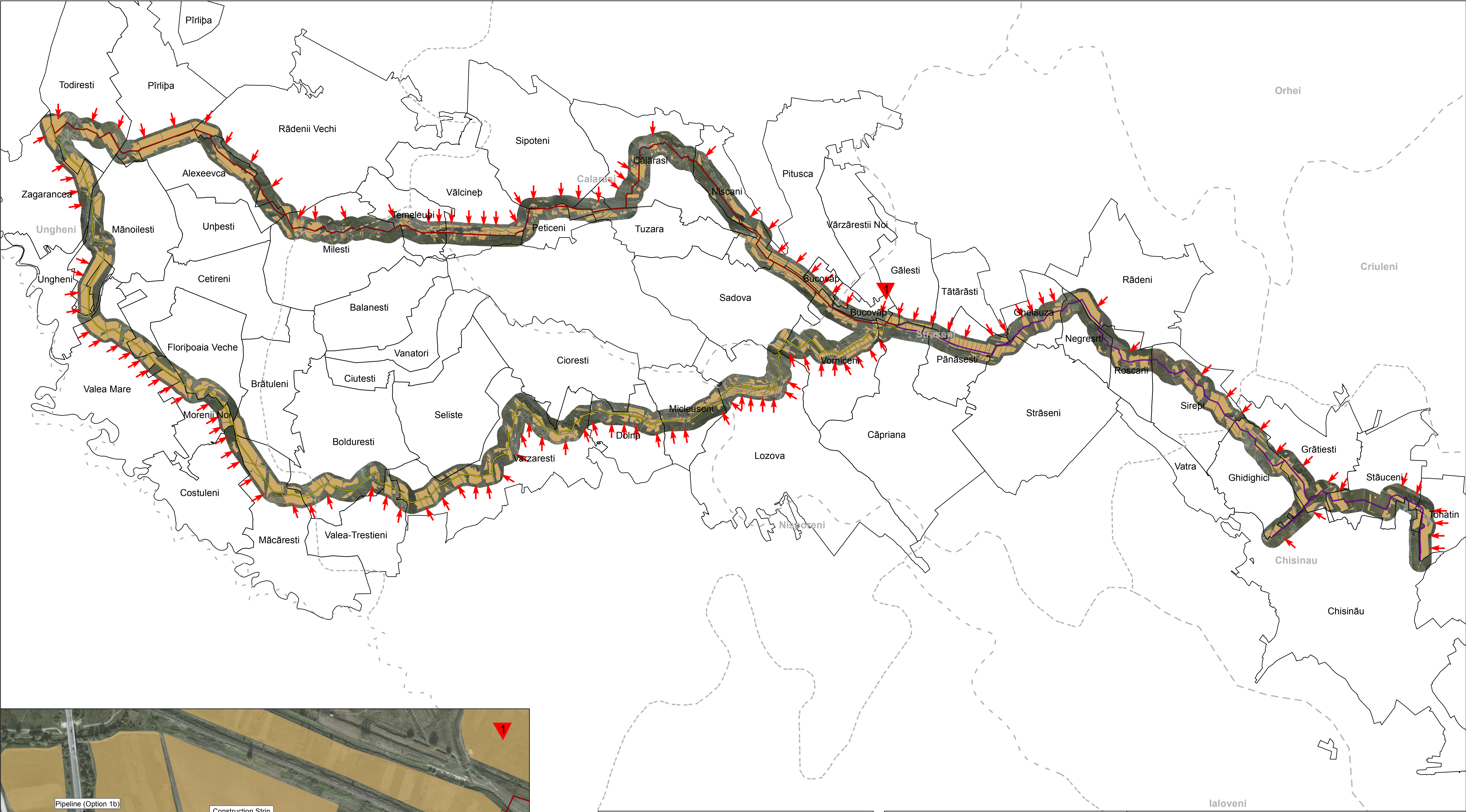
	Name	Date
Checked by	A.Fricke / M.Heidt-Ivenz	17.07.2015
Revised by	S.Sousa	17.07.2015
Prepared by	J.Heinold	17.07.2015

1:110,000

 NORTH

**FICHTNER**





**Rationale**  
Soil, mixing, rutting and compaction are interrelated impacts commonly associated with construction activities and can greatly affect the soil's productivity. The pipeline is planned to cross several agricultural areas, where negative effects in the soil productivity due to mixing, rutting and compaction may be felt for both options. This is shown in this map.

All agricultural fields within the construction strip (16 meters) may suffer negative impacts on productivity due to the works. This map makes use of red arrows to point the location of the areas of expected negative impact.

In the box, one example is shown of how the impacts on soil productivity have been considered for the assessment.

Please refer to Sections 7.3.6 and 8.1.1.2 of the ESIA Report for further details.

**Example**

Construction Strip

Area affected by construction

**Legend**

Ephemeral agricultural area (Source: IPOT)

Expected areas of impact on:

Soil productivity

Districts

Localities


**Options**

1b

2

Common Section

**Fichtner GmbH & Co.KG**  
Sarweystr.3 70191 Stuttgart Germany phone: +49 711 8995-0 fax: +49 711 8995-459 info@fichtner.de

Client:  Guvernul Republicii Moldova  
Ministerul Economiei

**Ungheni - Chisinau Natural Gas Pipeline**

Map No. 5  
Agricultural areas in the project area, and expected areas of impact (loss of productivity)

0 1.5 3 6 9 12 km

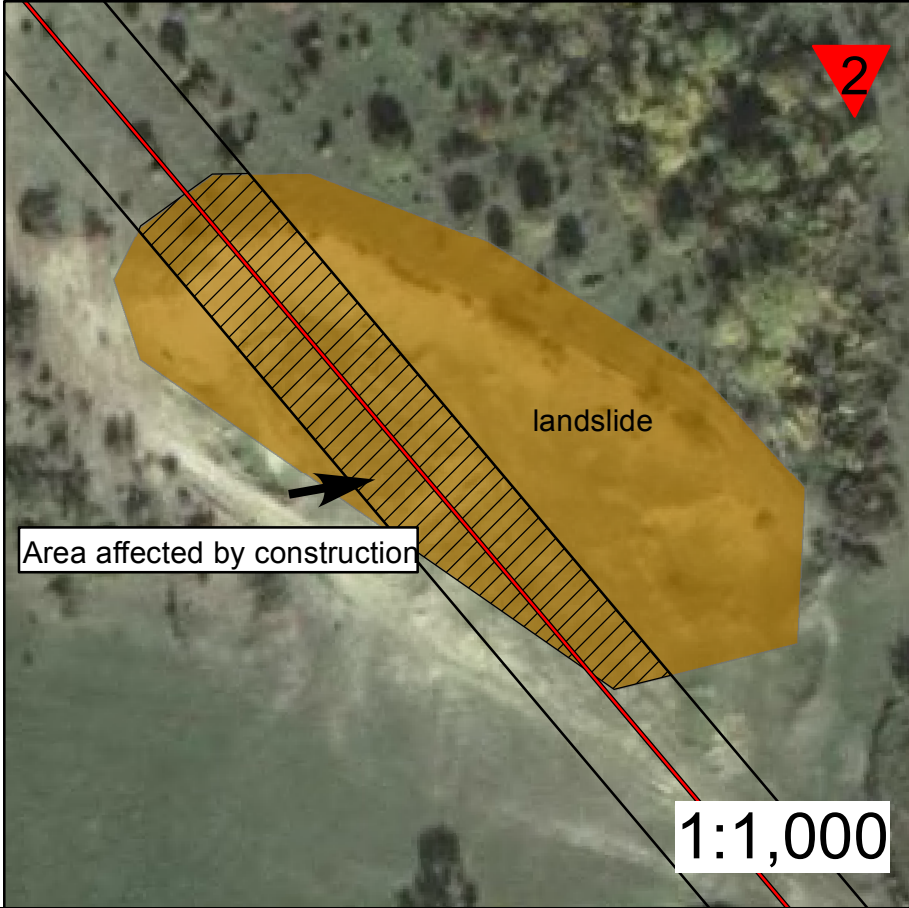
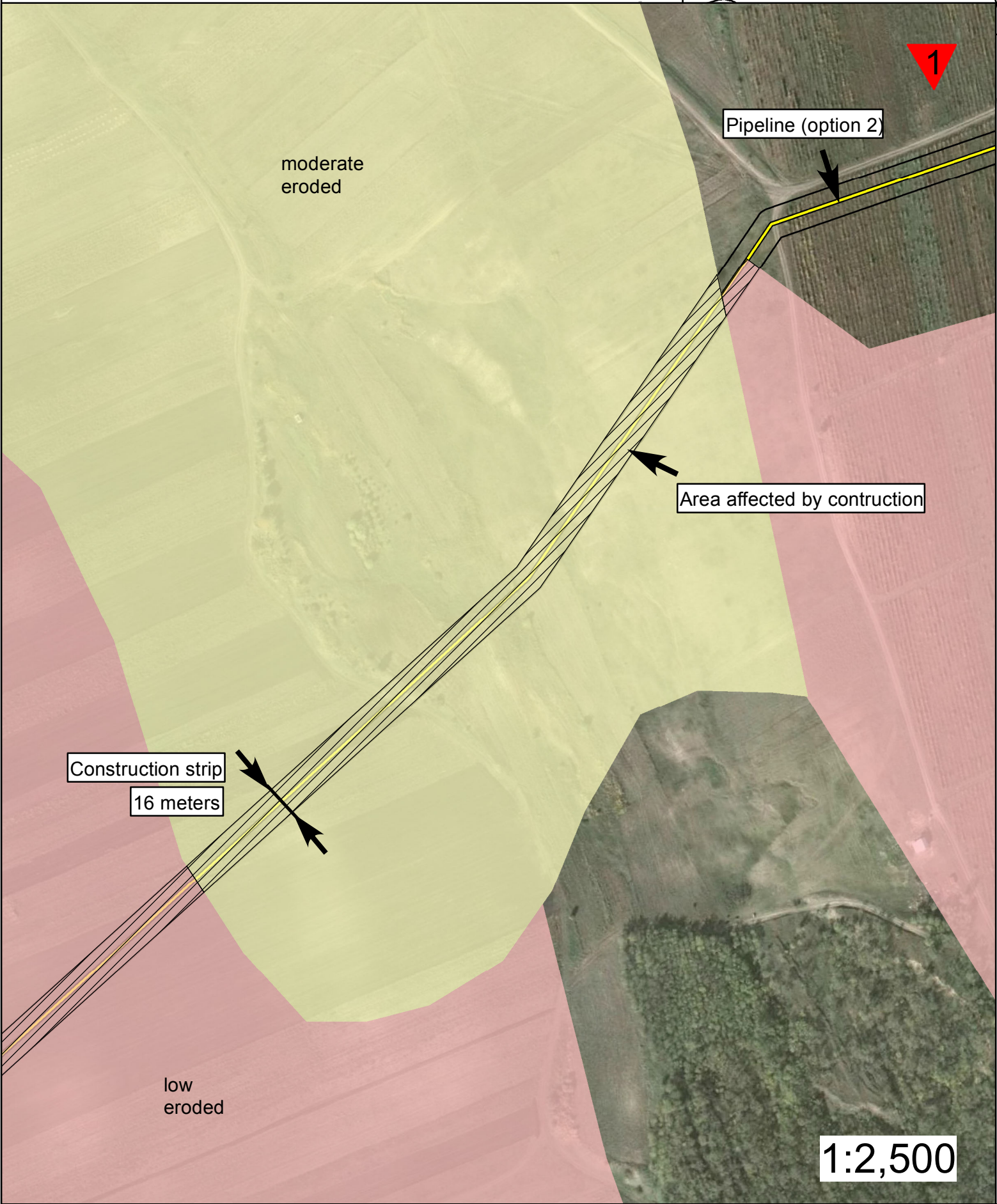
	Name	Date
Checked by	A.Fricke / M.Heidt-Ivenz	17.07.2015
Revised by	S.Sousa	17.07.2015
Prepared by	J.Heinold	17.07.2015

1:110,000

**FICHTNER**

**NORTH**





**Rationale**

Temporary access roads, movement of construction machinery, digging of trenches and removal of vegetation are likely to cause erosion effects, especially in areas where the soil is already eroded or landslides exist.

Several eroded areas and landslides have been avoided in the planning stage, but some are still present in the project area, as is shown in this map.

All eroded soils and landslides within the construction strip (16 meters) may suffer erosion impacts due to the works. This map makes use of red and blue arrows to point the location of the areas of expected negative impact.

In the boxes two examples are shown of how the erosion impacts have been considered for the assessment.

Please refer to sections 7.1.4 and 8.1.1.1 of the ESIA Report for further details.

**Example**

Construction Strip

Area affected by construction

**Legend**

Heavily eroded areas (source: National Geospatial Data Fund)

Moderate eroded areas (source: National Geospatial Data Fund)

Low eroded areas (source: National Geospatial Data Fund)

Landslides (source: IPOT)

**Expected areas of impact on:**

Eroded areas

Landslides

Districts

Localities

**Options**

1b

2


Common Section

The soil erosion areas shown in this map are digitalized from data from the National Geospatial Data Fund. This map only shows eroded areas and landslides crossed or located close by the options. The digitalization was done on a 1:10,000 scale.

Fichtner GmbH & Co.KG

Sarweystr.3 70191 Stuttgart Germany phone: +49 711 8995-0 fax: +49 711 8995-459 info@fichtner.de

Client:



Guvernul Republicii Moldova  
Ministerul Economiei

Ungheni - Chisinau Natural Gas Pipeline

Map No. 4

Eroded areas and landslides in the project area and expected areas of impact (erosion enhancement)

0

1.5

3

6

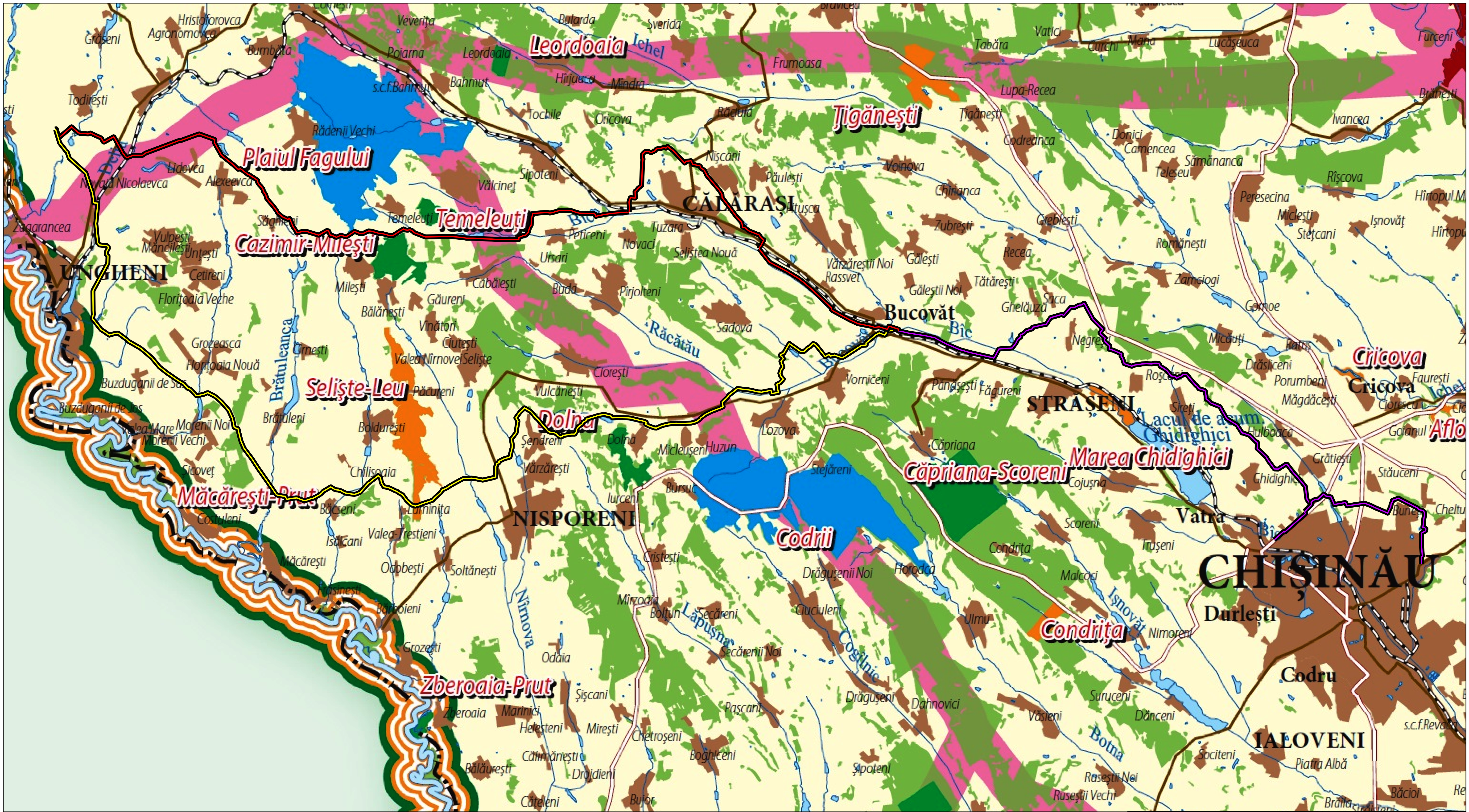
9

12

km

	Name	Date	1:110,000	<div><div></div><div>NORTH</div></div>
Checked by	A.Fricke / M.Heidt-Ivenz	17.07.2015		
Revised by	S.Sousa	17.07.2015	<div>FICHTNER</div>	
Prepared by	J.Heinold	17.07.2015		





Legend

- Nivelul zonelor-nucleu  
Уровень территорий-ядер  
Level of Core Areas
- local • локальный • local
  - superlocal • суперлокальный • superlocal
  - național • национальный • national
  - internațional • международный • international

Ecological Corridors

Național • Национальный • National

planificat  
планируемый  
planned

Прутский коридор  
Coridorul Prut  
Prut River Corridor

Padurea Domneasca  
Denumirea zonei-nucleu  
Название территории-ядра  
Core Area name

Căi ferate • Железные дороги • Railways

Drumuri • Дороги • Roads

magistrale • магистральные • magistral

naționale • национальные • national

Options

- 1b
- 2
- Common Section

The maps are produced within the project  
"Development of the National Ecological Network of Moldova  
as part of the Pan-European Ecological Network"  
implemented in cooperation with IUCN  
and funded by the Norwegian Ministry of Foreign Affairs.  
Original Map Scale: 1: 500.000  
Source: <http://www.biotica-moldova.org>

Fichtner GmbH & Co.KG

Sarweystr.3 70191 Stuttgart Germany phone: +49 711 8995-0 fax: +49 711 8995-459 info@fichtner.de

Client:  Guvernul Republicii Moldova  
Ministerul Economiei

Ungheni - Chisinau Natural Gas Pipeline

Map No. 3  
Ecological Corridors - National Ecological Network of the Republic of Moldova

0 1.5 3 6 9 12 km

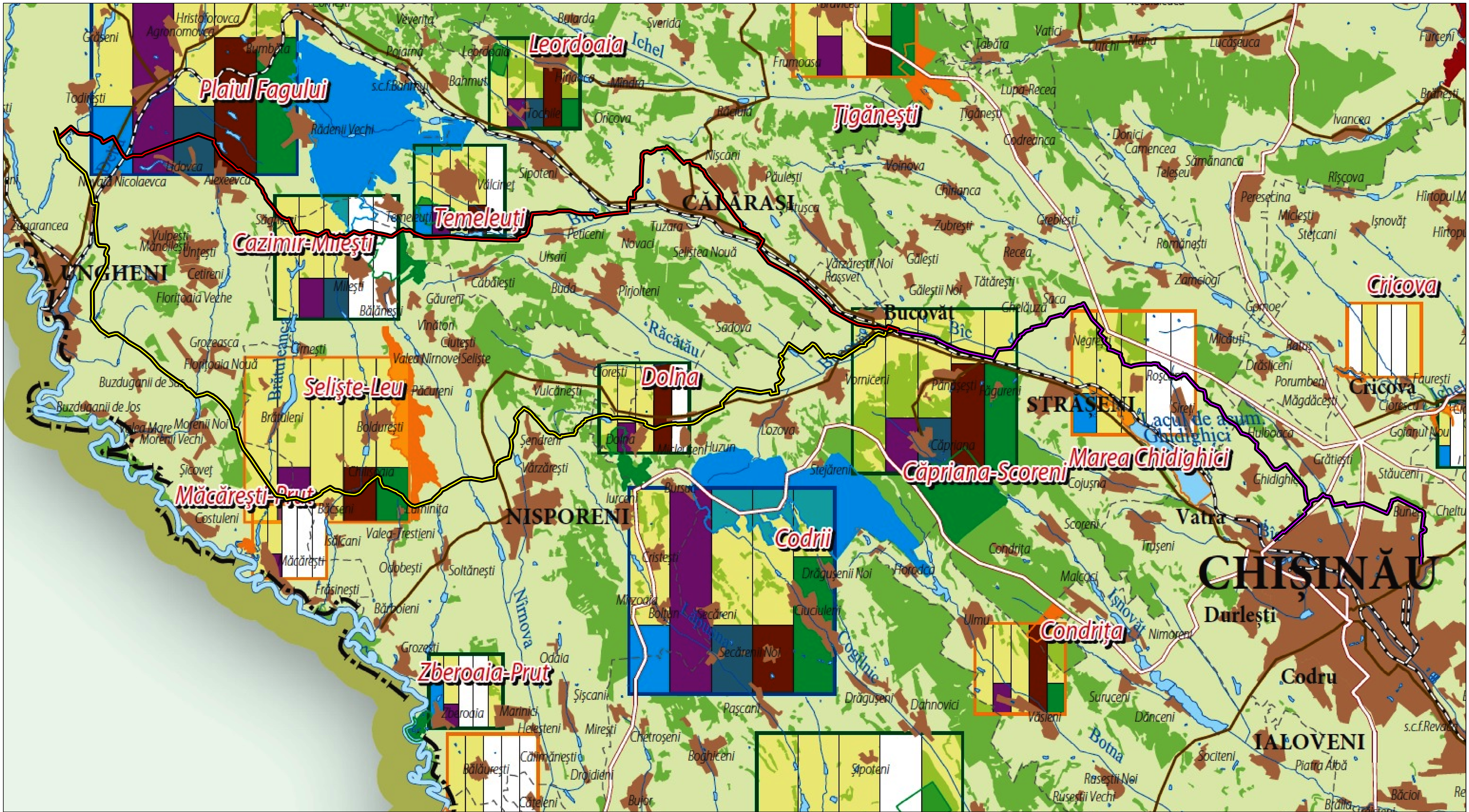
	Name	Date
Checked by	A.Fricke / M.Heidt-Ivenz	17.07.2015
Revised by	S.Sousa	17.07.2015
Prepared by	J.Heinold	17.07.2015

1:110,000



FICHTNER





Legend

- Importanța zonelor-nucleu  
Уровень территорий-ядер  
Importance of Core Areas
- local - локальный - local
  - superlocal - суперлокальный - superlocal
  - național - национальный - national
  - internațional - международный - international

Denumirea zonei-nucleu  
Название территории-ядра  
Core Area name

Speciile țintă • Целевые виды • Target species

- mamifere protejate de  
Convenția de la Berna  
млекопитающие, охраняемые  
Бернской конвенцией  
mammals protected  
by the Bern Convention
- insecte incluse în Lista Roșie Internațională  
IUCN (amenințate cu dispariția și aproape  
de starea celor „amenințate”)  
насекомые из всемирного красного списка  
МСОП (находящиеся под угрозой исчезновения  
и в состоянии, близком к угрожаемому)  
insects of IUCN World Red List  
(threatened and near threatened)
- păsări protejate de  
Convenția de la Bonn  
птицы, охраняемые  
Боннской конвенцией  
birds protected by  
the Bonn Convention
- plante superioare amenințate  
cu dispariția conform legislației  
Republicii Moldova  
высшие растения, находящиеся под  
угрозой исчезновения (по  
законодательству Республики Молдова)  
threatened highest plants (following the  
law of the Republic of Moldova)
- amfibieni și reptile incluse  
în Lista operațională a REN  
амфибии и рептилии  
из Операционного списка НЭС  
amphibians and reptiles  
of the NEN Operational List

Numărul de specii  
Число видов  
Number of species

- foarte mare  
очень большое  
very high
- mare  
большое  
high
- semnificativ  
значительное  
significant
- nesemnificativ  
незначительное  
insignificant
- neevaluat  
не оценивался  
not evaluated

- Căi ferate • Железные дороги • Railways
- Drumuri • Дороги • Roads
- magistrale • магистральные • magistral
- naționale • национальные • national

Options

- 1b
- 2
- Common Section

The maps are produced within the project  
"Development of the National Ecological Network of Moldova  
as part of the Pan-European Ecological Network"  
implemented in cooperation with IUCN  
and funded by the Norwegian Ministry of Foreign Affairs.  
Original Map Scale: 1: 500.000  
Source: <http://www.biotica-moldova.org>

Fichtner GmbH & Co.KG

Sarweystr.3 70191 Stuttgart Germany phone: +49 711 8995-0 fax: +49 711 8995-459 info@fichtner.de

Client:  Guvernul Republicii Moldova  
Ministerul Economiei

Ungheni - Chisinau Natural Gas Pipeline

Map No. 2  
Target Species - National Ecological Network of the Republic of Moldova

0 1.5 3 6 9 12 km

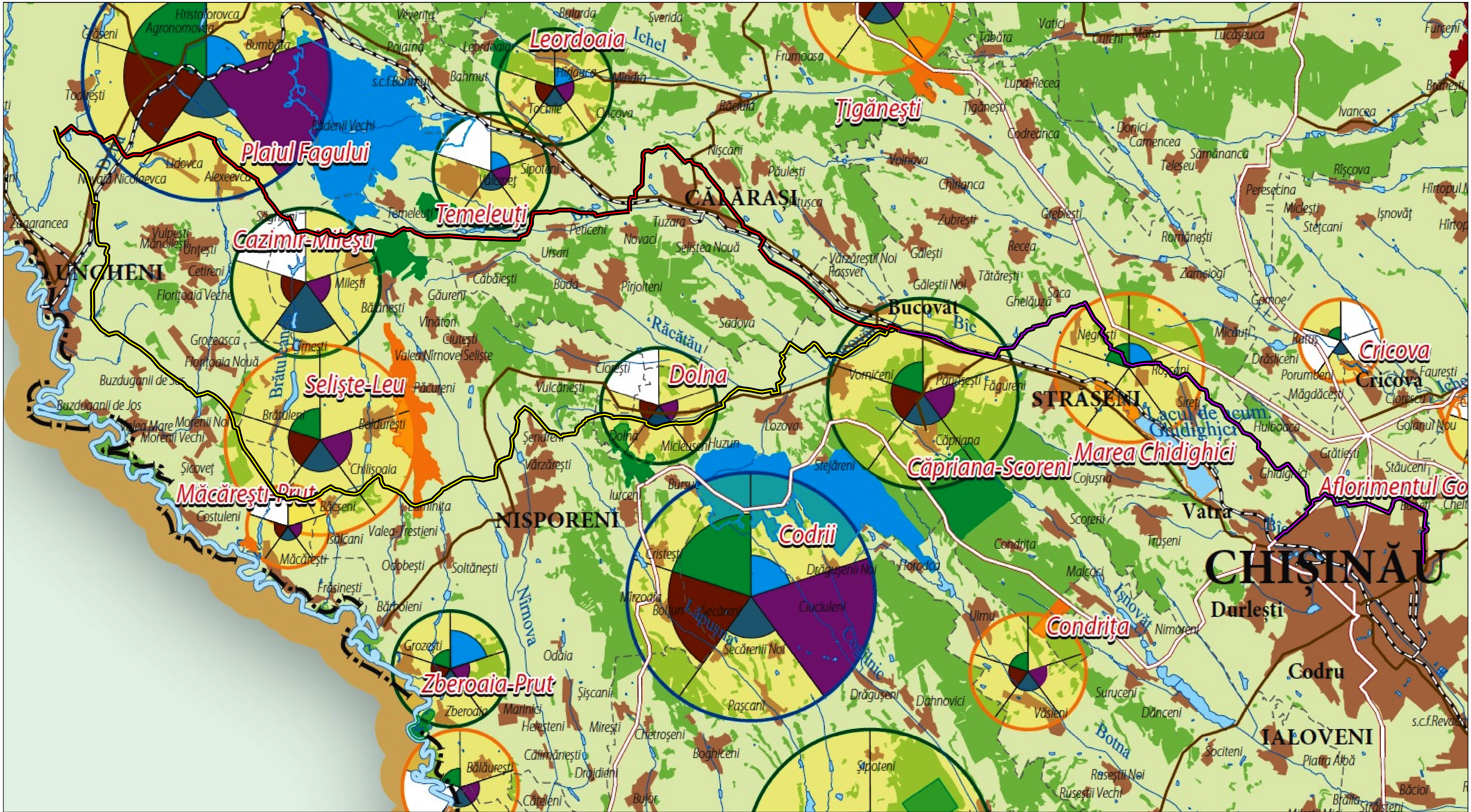
	Name	Date
Checked by	A.Fricke / M.Heidt-Ivenz	17.07.2015
Revised by	S.Sousa	17.07.2015
Prepared by	J.Heinold	17.07.2015

1:110,000



FICHTNER





Legend

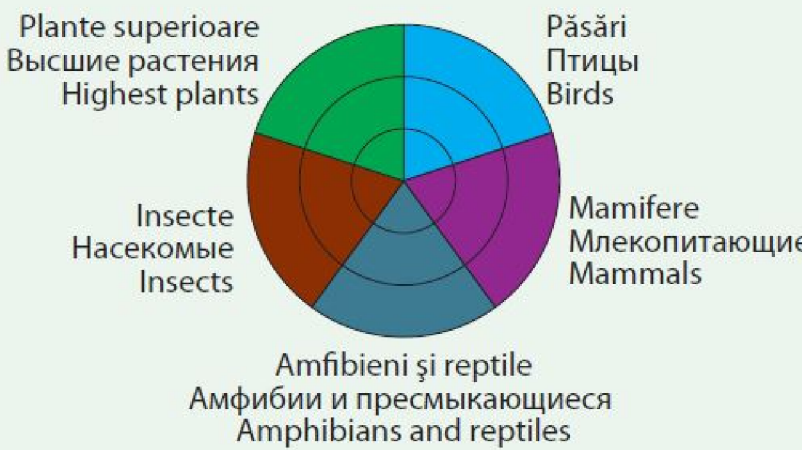
Nivelul zonelor-nucleu  
Уровень территорий-ядер  
Level of Core Areas

local • локальный • local  
superlocal • суперлокальный • superlocal  
național • национальный • national  
internațional • международный • international

Numărul de specii  
Число видов  
Number of species

foarte înalt  
очень высокое  
very high  
înalt  
высокое  
high  
semnificativ  
значительное  
significant  
nesemnificativ  
незначительное  
insignificant  
neevaluat  
не оценивалось  
not evaluated

Valorile de bază ale biodiversității  
Основные ценности биоразнообразия  
Major biodiversity values



Căi ferate • Железные дороги • Railways  
Drumuri • Дороги • Roads  
magistrale • магистральные • magistral  
naționale • национальные • national

Denumirea zonei-nucleu  
Название территории-ядра  
Core Area name

Options  
1b  
2  
Common Section

The maps are produced within the project  
"Development of the National Ecological Network of Moldova  
as part of the Pan-European Ecological Network"  
implemented in cooperation with IUCN  
and funded by the Norwegian Ministry of Foreign Affairs.  
Original Map Scale: 1: 500.000  
Source: <http://www.biotica-moldova.org>

Fichtner GmbH & Co.KG

Sarweystr.3 70191 Stuttgart Germany phone: +49 711 8995-0 fax: +49 711 8995-459 info@fichtner.de

Client: Guvernul Republicii Moldova  
Ministerul Economiei

Ungheni - Chisinau Natural Gas Pipeline

Map No. 1  
Major Biodiversity Values - National Ecological Network of the Republic of Moldova



	Name	Date
Checked by	A.Fricke / M.Heidt-Ivenz	17.07.2015
Revised by	S.Sousa	17.07.2015
Prepared by	J.Heinold	17.07.2015

1:110,000

