

CONTENT

1. INTRODUCTION (W.E. Kelly, O. Mazáč, S. Mareš)	5
2. BASIC ASPECTS OF ENVIRONMENT PROTECTION (O. Mazáč)	9
2.1. Geological aspects (S. Mareš)	9
2.2. Geophysical aspects	10
2.2.1. Effect of physical fields on living organism: principles	10
2.2.2. Effect of physical fields on other environment: principles	11
3. GEOPHYSICAL METHODS AND RELATED PHYSICAL PROPERTIES APPLIED IN ENVIRONMENTAL INVESTIGATIONS (S. Mareš)	13
3.1. Surface geophysical methods	13
3.1.1. Gravimetry	13
3.1.2. Magnetometry	13
3.1.3. Geothermics	13
3.1.4. Radiometric methods	14
3.1.5. Geoelectrical methods	14
3.1.6. Seismology and seismic methods	21
3.1.7. Atmogeochemical survey	23
3.2. Borehole geophysics	23
3.2.1. Wireline logging	23
3.2.2. Logging with cone penetrometers	24
3.2.3. Crosshole scanning	26
3.3. Remote sensing	26
3.4. Optimum combination of geophysical methods	27
3.5. Physical parametres of soils, rocks and some pollutants	28
4. NEGATIVE INFLUENCES OF GEOPHYSICAL ACTIVITY ON THE ENVIRONMENT (O. Mazáč) ..	32
5. INFLUENCE OF SOME (GEO)PHYSICAL FIELDS ON LIVING ORGANISMS (O. Mazáč)	33
5.1. Electromagnetic fields (s.l.)	33
5.1.1. Electromagnetic field (s.s.)	33
5.1.2. Electrical field	36
5.1.3. Magnetic field	37
5.2. Influence on traffic accidents	39
5.3. Possible influence of geologically disturbed zones on human mortality	40
5.4. Radioactive fields	41
5.5. Seismic fields	45
6. IMPACT OF GEOPHYSICAL FIELDS ON INFRASTRUCTURE (W.E. Kelly)	48
6.1. Electrical fields	48
6.2. Thermal fields	51
6.3. Stress fields	52
7. ROLE OF APPLIED GEOPHYSICS FOR SOLVING SOME ENVIRONMENTAL PROBLEMS (O. Mazáč)	53
7.1. Groundwater resources (S. Mareš)	56
7.2. Protection and utilization of soils	59
7.2.1. Waterlogging and melioration systems	60
7.2.2. Physico-pedological conditions of soil environment	62

7.2.3. Pollution spreading and transport	.64
7.3. Transport parameters	.65
7.4. Waste management (S. Mareš)	.69
7.5. Buried ammunition, metallic objects and toxic agents	.73
7.6. Nuclear power plants (S. Mareš)	.75
7.7. Pollution of groundwater and rocks	.77
7.7.1. Agricultural pollution	.77
7.7.2. Thermal pollution	.78
7.7.3. Chemical pollution	.78
7.7.4. Petroleum pollution	.80
7.8. Quality of soil and/or rock foundations	.82
7.9. Seepage (leakage) from dumps and basins	.83
8. GEOPHYSICAL FIELDS FOR REDUCING ENVIRONMENTAL DEGRADATION (W.E. Kelly)	.85
8.1. Natural fields	.85
8.1.1. Chemical fields	.85
8.1.2. Thermal fields	.85
8.2. Artificial fields	.86
8.2.1. Electrokinetic fields	.86
8.2.2. Thermal fields	.87
8.2.3. Photolysis	.87
8.2.4. Stress	.87
9. ECONOMIC ADVANTAGE OF GEOPHYSICAL TREATMENT OF ENVIRONMENTAL PROBLEMS (O. Mazáč)	.88
9.1. Case histories of hydrogeological character	.88
9.2. Case history of buried hazardous waste	.90
10. CONCLUSIONS (W. E. Kelly)	.91
References	.92