

Content	Page
1. INTRODUCTION .....	1
2. BASIC TYPES OF DEPOSITS AND RESERVES CLASSIFICATION .....	1
2.1. BASIC CHARACTERISTICS AND TYPES OF DEPOSITS .....	1
2.2. SUMMARY MINE-GEOLOGICAL DOCUMENTATION .....	2
3. RESERVES OF THE DEPOSIT AND THEIR CLASSIFICATION.....	2
3.1. CHOSEN METHODS OF RESERVES ESTIMATION .....	3
3.2. RECORDS ON RESERVED DEPOSITS .....	3
4. GENERAL CHARACTERISTICS OF MINE WORKINGS AND THEIR REPRESENTATION .....	4
5. EARLY DEVELOPMENT OF THE DEPOSIT FROM THE SURFACE .....	5
5.1. EARLY DEVELOPMENT BY ADITS.....	6
5.2. EARLY DEVELOPMENT BY SHAFTS .....	6
5.2.1. <i>Inclined Shafts</i> .....	6
5.2.2. <i>Vertical Shafts</i> .....	8
5.2.3. <i>Early Development by Ramps and Inclines</i> .....	10
5.2.4. <i>Combined Early Development</i> .....	10
6. LEVEL DEVELOPMENT .....	10
6.1. DEVELOPMENT OF LEVELS IN FLAT-LYING DEPOSITS.....	10
6.2. DEVELOPMENT OF LEVELS WITH INCLINED DEPOSITS.....	11
6.3. LEVEL SPACING, OR THE HEIGHT OF LEVEL.....	11
6.4. LANDINGS .....	12
7. DIVIDING AND PREPARATION OF DEPOSIT ON LEVEL FOR MINING.....	13
7.1. DIVIDING AND PREPARATION OF METALLIFEROUS DEPOSITS.....	13
7.1.1. <i>Preparatory Workings in General</i> .....	13
7.1.2. <i>Chute Systems inside Stopes</i> .....	14
7.2. DIVISION AND PREPARATION OF HORIZONTAL COAL DEPOSITS OF GREAT THICKNESS.....	14
7.3. DIVISION OF THE GROUP OF FLAT TO STEEP SEAMS .....	15
8. PURPOSE AND IMPORTANCE OF SECTIONAL AND PREPARATORY LONG MINE WORKINGS .....	16
8.1. CROSSCUTS .....	16
8.2. BLIND SHAFTS AND INSIDE SHAFTS .....	17
8.3. RAISES, WINZES AND ORE CHUTES .....	18
8.4. DRIFTS AND SECTIONAL PASSAGES .....	18
8.5. INCLINED PASSAGES.....	18
8.6. SNICKET GATES AND POCKETS.....	18
9. TIME RELATION BETWEEN DEVELOPMENT AND MINING.....	19
10. PRINCIPLES ASSOCIATED WITH SURFACE MINE DEVELOPMENT .....	20
10.1. CHOICE OF THE PLACES OF DEVELOPMENT CUT AND EXITS FROM THE SURFACE .....	MINE 21
10.2. METHODS OF DEVELOPMENT.....	22
10.2.1. <i>Stripping without Cuts</i> .....	22
10.2.2. <i>Stripping with Cuts</i> .....	22
10.2.3. <i>Methods of Cut Creation</i> .....	26
10.2.4. <i>Parameters of Development Cuts</i> .....	26

<b>11. BUILDING OF SPOIL HEAPS .....</b>	<b>27</b>
11.1. SELECTION OF THE LOCATION OF SPOIL HEAP .....	27
11.2. METHODS OF SPOIL HEAP CONSTRUCTION .....	27
11.3. BASIC PARAMETERS OF SPOIL HEAPS .....	28
<b>12. DETERMINATION OF CAPACITY AND BASIC PARAMETERS OF THE SURFACE MINE .....</b>	<b>29</b>
12.1. GENERAL PRINCIPLES OF THE SELECTION OF EXCAVATION, TRANSPORT AND STACKING TECHNOLOGIES .....	29
12.2. DETERMINATION OF PARAMETERS OF WORKING BENCHES .....	29

## 2. BASIC TYPES OF DEPOSITS AND RESERVES CLASSIFICATION

### 2.1. Basic Characteristics and Types of Deposits

The result of geological-exploratory works and their evaluation must prove the economical possibility of development of the deposit or its part for exploitation and provide data necessary for planning activity. For these reasons, it is necessary to determine the size, position, shape of the deposit and other facts.

The size of deposit, i.e. its parameters in the horizontal and vertical directions and its qualitative features, determines the scope of future mining activity. The size of deposit is given by the external outline of deposit mass by the outcrop of the deposit (scam). In the horizontal direction, the deposit (scam) may push out, split, pass into barren rocks or may be finished by artificial benches (e.g. gullies, ridges, terrace structures, surface structures), etc.

The outcrop of deposit (scam) may be real, i.e. the end of the deposit is verified by boreholes (identified grid), or corrected that is determined by extrapolating at half the distance between positive and negative boreholes. The internal outline of deposit can be determined by a line drawing through positive outcrop boreholes on the assumption that in extreme points of the internal outline, the thickness of deposit (scam) and also its quality do not change markedly.

In cases when any boreholes have not been drilled behind the internal outline of deposit, the expected outcrop of deposit (scam) is determined by means of the method of unlimited extrapolation.

The shape, size and position of deposit influence the mining technology and major advances of faces.

According to the character and complexity of geological structure of the reserved deposit, the distribution of solid and liquid substances, the deposits of solid minerals are divided into the following three groups:

1<sup>st</sup> group - deposits or parts of deposits with a simple geological structure, stable thickness and mineral strength, not or only slightly disturbed or not disturbed at all. Useful and/or harmful components are distributed regularly in the deposit. By deposit exploration, the proved reserves are located in these deposits.