

SURFACE MINES OF MINING AREA ŽACLÉŘ – CREATING AND USING OF FINANCIAL RESERVES FOR REMEDIATION AND RECLAMATION

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ABSTRACT

Companies engaged in mining are legally obliged to ensure remediation and reclamation of land affected by mining. Creation and use of financial reserves are subject to approval and control of the Mining Authorities. However, the methodology of creating financial reserves is decided by the mining company itself. In the paper, we describe the methods of creating financial reserves of a specific mining company GEMEC Union for remediation and reclamation after coal surface mining. The paper provides chronological comparisons of coal mining in two open pit mines, including the principles for creating and using financial reserves for remediation and reclamation.

Keywords: Jan Šverma Mine (JŠM), remediation, reclamation, mining, financial reserves.

1 INTRODUCTION

Surface coal mining is of great importance for the energy sector in the Czech Republic, but it is also associated with major interventions in the landscape, and it results in an overall change in the natural face of the landscape.

The GEMEC Union, a. s. took advantage of the fact that coal seams in the Žacléř mining area come to the surface, and therefore in the years 1998-2012 surface hard coal mining took place west of Jan Šverma Mine in Žacléř. At that time, four open pit mines were opened in total. This paper will focus on two of the four surface Žacléř open pit mines. [1]



Figure 1. Map of the mining area [1]

2 THE DESCRIPTION OF THE LOCALITY OF SURFACE HARD COAL MINING IN ŽACLĚŘ OPEN PIT MINES

The description of the mining locality

Žaclěř mining area is located in the cadastral areas of Černá Voda, Křenov, Lampertice, Žaclěř, Bobr, and Královec. The locality is situated in the East-Bohemian Region. Its area is 9.24 square kilometres, and it has the shape of a closed hendecagon (Figure 1). [1]

Surface hard coal mining in Žaclěř open pit mines

Žaclěř Mine II A was founded in 2000, Žaclěř Mine II A-A was opened later.

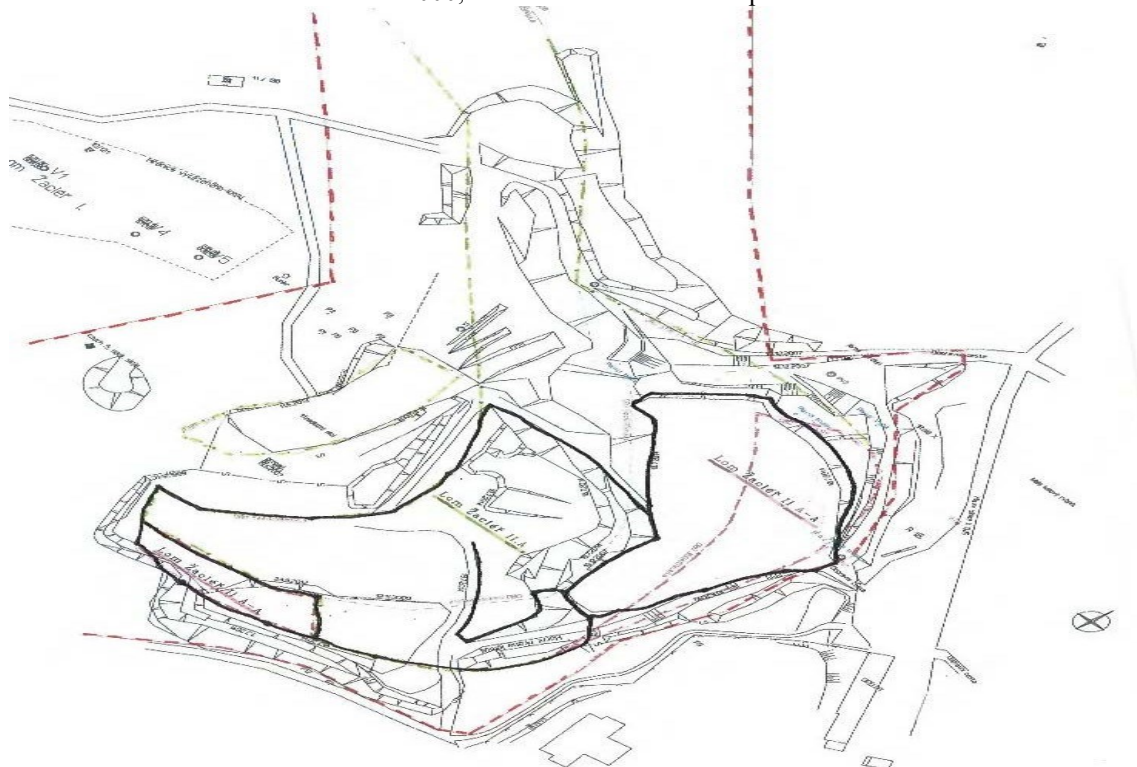


Figure 2. Marking the boundaries of the open pit mines in the Žaclěř mining area [1]

From 2000 to 2007, surface mining of residual black coal reserves was carried out in the starting areas southwest of the area of Jan Šverma Mine, namely in the form of quarrying. For quarry extraction, two seams forming strata (the 9th and 10th overlying seam and 11th overlying seam) were selected. [1]



Figure 3. An example of an overlying seam of Žaclěř Mine [1]

3 RECLAMATION OF OPEN PIT MINES

The concept of reclamation of open pit mines consists of filling them with excavated waste rock, excavated soil, appropriate filling materials, and subsequently covering them with a layer of topsoil and industrial composts with subsequent greening of the surface. In surface mining of hard coal, topsoil overburdens, subsoil, and waste rock are deposited (separately) at appropriate places in the locality. [2]

Due to a deficit of backfill after the mined coal, suitable filling mixture – mainly the fly ash from the Poříčí Power Plant – was used to fill vacant space (the space of mined seams). Subsequently, the remaining empty space was filled with waste rock, subsoil, and covered with topsoil. At present, the reclamation of Žaclěř Mine II AA is to be completed. [1]

Subsequently, after laying a fertile layer, the reclamation area was greened with meadow plants, and deciduous trees were planted forming hedges. Reclamation of the open pit mines was completed by the end of 2015. (Figure 4 Žaclěř Mine before reclamation, Figure 5 Žaclěř Mine after reclamation). [1]



Figure 4. Žaclěř Mine before reclamation [1]



Figure 5. Žaclěř Mine after reclamation [1]

4 LEGISLATION

To fulfil the obligations of remediation and reclamation, companies prepare the Plan for Opening, Preparation and Extraction (hereinafter referred to as POPE), the General Plan of Remediation and Reclamation (hereinafter referred to as GPRR), and the Remediation and Reclamation Plan, (hereinafter referred to as RRP). These plans contain proposals for the creation of financial reserves, quantification of expected costs for remediation and reclamation, and a technical plan and work schedule. [2]

Act No. 44/1988 Coll., On the Protection and Use of Mineral Resources (the Mining Act), as amended (hereinafter referred to as the “Mining Act”) imposes an obligation for the mining company to ensure remediation, which includes reclamation under special laws of all land affected by mining plus creating reserve funds. The amount of the reserve expenses must meet the needs of remediation of land affected by mining. [2]

Section 10 and 10 a) of the Act No. 593/1992 Coll., On Reserves for Determining the Income Tax Base, as amended, deal with keeping accounts and determining reserves. [3]

5 ANALYSIS OF THE CREATION AND USE OF RESERVES FOR ŽACLĚŘ MINE II A AND II A-A

Creation of reserves

For Mine II A, a mining permit was issued based on a decision of the District Mining Office (hereinafter referred to as DMO) in Trutnov on 18 May 1999.

The overview of the creation and use of reserves is shown in Table 1 – it chronologically compares the data on production, creation and use in individual years. The creation of reserves depends on the amount determined based on a calculation by the competent District Mining Office, in this case the DMO in Trutnov, at present, the DMO for the Hradec Králové and the Pardubice Regions based in Hradec Králové. [1]

For Žaclěř Mine II A, the amount of CZK 30 per extracted tonne was determined. At the end of the particular year, the yearlong production is multiplied by the determined amount and the calculated amount is deposited to an allocated account (in force since 2006). Determining the amount and its proposal is the company’s responsibility. If the DMO disagrees with the amount, it is entitled to increase the amount. [1, 3]

During the period of mining at Žaclěř Mine II A, a reserve amounting to CZK 6 million was created. During the particular year, reclamation takes place concurrently with mining; at this stage, it is the case of technical reclamation. Mined coal was replaced with overburden from the cuts. At the end of the particular year, the reclaimed part is surveyed and the amount, which can be drawn on the reserve, is calculated. [3]

For Žaclěř Mine II A-A, a mining permit was issued based on a decision of the District Mining Office in Trutnov on 4 March 2004. Based on a decision of the DMO, the creation of reserves per extracted tonne was determined for CZK 66. The overview of the creation and use of reserves for this mine is shown in Table 2.

The differences between the amounts for determining reserves for these two mines are subject to the following factors: higher fuel prices, inflation, etc. [1, 3]

Drawing on reserves

The procedure for drawing on reserves – the company submits geodetic surveying of the reclaimed space, it requests an opinion of the respective city or municipality in whose cadastral area mining is carried out, (based on Section 37 and Subsection 2 of the Act No. 44/1988 Coll., On the Protection and Utilization of Mineral Resources (the Mining Act), in this case Žacléř. Subsequently, it requests an opinion of the Ministry of Environment. After getting positive opinions, it will file an application to the appropriate DMO (in this case the DMO based in Hradec Králové). The DMO issues a decision authorizing the use of reserves. [1, 3]

Table 1. Overview of the creation and drawing on reserves in Mine II A [1]

YEAR/QUARTER	GROSS MINING [t]	CREATION [CZK]	DRAWING [CZK]	OVERBURDEN [m³]	RECLAMATION [m³]
1999				39,441	1,253
2000	44,879	1,346,370	592,914	70,114	30,876.8
2001	54,894	1,646,820	1,261,580	59,492	45,577.3
2002	36,010	1,080,300	498,059	73,299	33,793.6
2003	22,209	666,270	368,117	56,005	3,0943
2004	21,168	635,040	0	60,823	5,695
2005	4,660	139,800	361,037	14,772	38,443
2006	7,910	237,300	0	33,606	27,740
2007 I	0	0	425,791	0	1,030
2007 II,III,IV	8,750	262,500	0	18,126	3,798
2008 I, II	0	0	55,078	0	112
2008 III, IV	0	0	0	0	0
2009 I	0	0	71,714	0	5,091
2009 II,III,IV	0	0	0	0	13,719
2010 I, II	0	0	270,164	0	5,460
2010 III, IV	0	0	0	0	3,605
2011 I, II	0	0	106,071	0	5,188
2011 III, IV	0	0	0	0	7,793
2012 I, II	0	0	238,700	0	7,952
2012 III, IV	0	0	0	0	0
2013 I, II	0	0	207,809	0	14,578
2013 III, IV	0	0	0	0	3,000
2014 I, II	0	0	86,528	0	3,070
IN TOTAL	200,480	6,014,400	4,543,562	425,678	289,718

Table 2. Overview of the creation and drawing on reserves Mine II A–A [1]

YEAR/QUARTER	GROSS MINING [t]	CREATION [CZK]	DRAWING [CZK]	OVERBURDEN [m³]	RECLAMATION [m³]
2004	8,110	535,260		15,970	0
2005	20,480	1,351,680	541,797	47,562	24,916
2006	4,360	287,760		16,590	25,585
2007 I		36,300		7,318	910
2007 II,III,IV	550	36,300	380,452	4,934	12,506
2008 I,II				0	21,014
2008 III, IV			675,194	0	5,797
2009 I				0	2,720
2009 II,III,IV			171,561	0	4,837
2010 I, II				0	0
2010 III, IV			97,433	0	240
2011 I, II				0	1,505

2011 III, IV			26,525	0	0
2012 I, II				0	1,178
2012 III, IV			16,321	0	0
2013 I, II				0	9,337
2013 III, IV			121,632	0	300
2014 I, II				0	690
IN TOTAL	33,500	2,211,000	2,030,915	92,374	111,535

6 CONCLUSION

During the extraction in Mines II A, II A-A, financial reserves of CZK 8,225,400 were created. Technical reclamation was carried out according to the approved plan of reclamation. During the technical reclamation funds in the amount of CZK 6,574,477 were drawn. This amount corresponds to the state reclamation (see Figure 1). After technical reclamation is completed, the next two years biological reclamation will follow. For these activities CZK 1,650,923 will remain in the reserve fund.

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