THE MINISTRY OF ECONOMY OF COMMERCE ROMANIA

Mine Closure a Social Mitigation Project

Feasibility Study for Establishing a Mining Museum Within Aninoasa Mine

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MINE CLOSURE A SOCIAL MITIGATION PROJECT

FEASIBILITY STUDY FOR ESTABLISHING A MINING MUSEUM WITHIN ANINOASA MINE

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EXECUTIVE SUMMARY

The 'Feasibility Study for Establishing a Mining Museum within Aninoasa Mine' has been developed to establish whether a museum can be established on the site of the Aninoasa Mine. The study has taken into account the initial set up cost, the ongoing operational costs, the staffing levels and the potential for funding.

The site was examined and the current state of the buildings and other resources was assessed. A design backed up by architectural expertise was developed to provide a modest museum site that offered attractions for tourists' visiting the area and showed off the heritage of the hard coal mining in the Jiu Valley .

The result of this study identified that:

The site itself could be developed into a compact museum site that would offer to the public a view of the history of the mining industry in the Jiu Valley and Aninoasa mine in particular in an attractive way. It would be possible for the site to be adapted for use as a museum. The Piscu tunnel and the old explosive store offer suitable facilities to give the visitor the impression of working underground and there is sufficient space to develop the museum to exhibit large pieces of modern mining equipment.

The refurbishment and strengthening of the buildings and the design of the site have been developed and are contained in the report. Architectural alterations and designs to fit in with the conversion to a museum have been included. It assumes the rest of the site will be demolished.

Costs have been developed for both the redevelopment of the site and the ongoing museum operation. The redevelopment of the site is likely to cost in excess of E 2,000,000. It has been assumed that the cost of the work will be borne by the Mine Closure and Social Mitigation project budget, but the total amount for the refurbishment and conversion may exceed this budget and no ther source of funding has been identified be able to supplement that budget if necessary.

Income and expenditure has been assessed. The base case for the visitor numbers has been taken as the number currently visiting the Petrosani Mining Museum. This is a considerably smaller establishment but is in a location that is in the centre of Petrosani and therefore more accessible and the comparison is therefore valid.

The analysis carried out has identified that the income from the sale of tickets cannot cover the ongoing costs incurred by the museum unless there is a large increase in visitor numbers and this cannot be justified since the area has little other attractions for large scale tourism at the moment.

It also showed that there a very few additional sources of funding. Project funding may be available for one off projects but would have to be allocated to a new project and not ongoing expenses. National and international funding is limited and no guaranteed sources of funding could be found.

The local mayor has expressed a wish to fund the project but no indication has been given as to whether this is possible. The study has identified that there will be a shortfall in income to cover expenses and this can only come from the local community, If this is not feasible then the project can not be considered viable. The intention was to make the museum a source of income and employment for the local community but this cannot be shown and therefore the conclusion has to be that the museum is not feasible.

1 GENERAL INFORMATION

Name of the study

Feasibility Study for Establishing a Mining Museum within Aninoasa Mine

Author of the study

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Beneficiary

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Contracting authority

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Location of proposed museum

The museum to be located on the southern curtilage of Aninoasa Mine, Aninoasa town, Petrosani Municipality, Hunedoara County.

Object of the study, including study opportunity and sustainability

The objective is to develop a feasibility study regarding the setting up of a mining museum within Aninoasa mine. This study will provide the basis for a detailed technical project to be prepared by design institutes.

2 DESCRIPTION OF THE PROJECT

Aninoasa Mine is closing and during the consultations that accompanied the decision to close came a suggestion that the mine could be turned into a mining museum. This project has been developed to see whether the idea of having a museum at this site is viable and to determine whether it should progress beyond the idea phase to the detailed planning.

It was proposed that the work of the project was to be based on a desk-review of:

1. an existing proposed plan for the mining museum,
2. description and historical record of the mine and
3. discussion with the design institute regarding the developed care & maintenance/closure plan.

None of the existing ideas had been fully developed and in discussions there was no definitive plan. The work of the project has therefore been developed from field observations and analysis carried out by the consultancy team to supplement the existing data provided by the design institute and mining company.

Documents relating to the description and historical records of the mine were obtained from the local design institute and Aninoasa Mine itself.

The study comprised two stages:

1. inception stage;
2. feasibility study stage

The Inception Phase identified two options (See Annexe 1) for consideration and it was agreed that the smaller option should be considered in greater depth for the Feasibility study stage. This feasibility study therefore considers a limited development of the Aninoasa site into a mining museum.

3 TECHNICAL DATA

3.1 Aninoasa Mine Curtilage

The Aninoasa operation is located in the centre of Jiu valley coal deposits and its borders are:

- the Aninoasa brook (to the East),
- the former coal fields Dalja and Iscroni (Livezeni Sud),
- and the coal field Vulcan to the West, which forms a normal line following the brook Plesnitoarea.

Administratively Aninoasa Mine belongs to Aninoasa town – Petrosani municipality, Hunedoara County.

The area is accessed by:

- Railways Filiasi-Tg.Jiu –Simeria and Petrosani-Livezeni –Lupeni
- National road DN 66 Tg.Jiu- Petrosani – Deva and
- the county roads Petrosani –Campul lui Neag and Iscroni –Aninoasa.

3.2 Geomorphology of the Area

The Jiu Valley hard coal deposits, to which Aninoasa coal field belongs, is located in the South of Hunedoara County:

latitude of 45^{o} 17' – 45^{o} 22' North, and
longitude of 20^{o} 12' – 21^{o} 12' East.

The deposits are in the shape of a triangle, with the longest side of 45.8km and the other sides of 2.3km (West) and 9.7 km (East).

This is a hilly area, except for the major feature of the West Jiu Valley River. The most important peaks being Plesnitoarea Hill (757m height) and Piscu Hill, the latter being a link to the northern mountains. Height ranges are rather small in the South, and there is a gradual transition to Vulcan Mountains. All surface works related to this mine are located on the northern flank of the coal deposit, to the West of Aninoasa brook Aninoasa town is a settlement along this brook down to its confluence with West Jiu Valley River.

3.3 Hydrographical Network

The hydrographical network is based on the West Jiu Valley River, which collects the brooks and waterways crossing the region from the North to South, including the brooks Plesnitoarea, Piscu, Priboi and Aninoasa, from the northern slope, or the brooks Valea Ungurului and Pinului, from the southern one.

The groundwater level in the area is at an average 3.00m.

3.4 Climate

The perimeter under investigation has a temperate-continental climate, with the following characteristics:

- the annual average temperature ..... + 6,8°C
- the minimum absolute temperature..... -29,0°C
- the maximum absolute temperature ..... +35,8°C

The average annual precipitation level is 841mm, determined as an average over the last 10 years'.

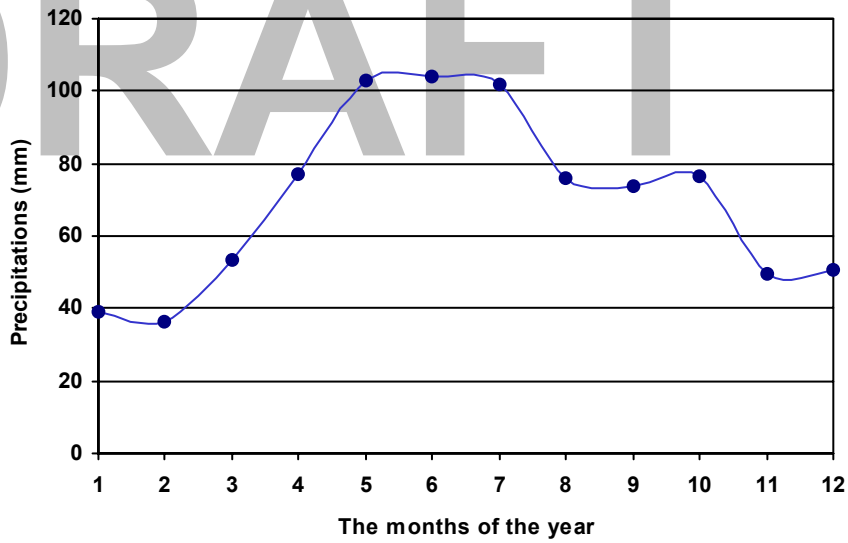

Fig.1- Monthly Precipitation Chart

The distribution of precipitation per seasons shows as below:

- in winter .....126,2 mm
- in spring.....233,0 mm
- in summer.....281,7 mm
- in autumn .....200,1 mm

"Days with precipitation" means those days in which water falling in the form of rain, sleet, freezing rain, snow etc. surpasses 0,1mm.

Other important climate factors are the magnitude and direction of the wind. The main direction of the wind is from South (12.6%) and from North-West (5%). The percentage for "Calm" regime is 64%, and the average wind intensity (on Beaufort scale) is from 0.4m/s to 3.8m/s.

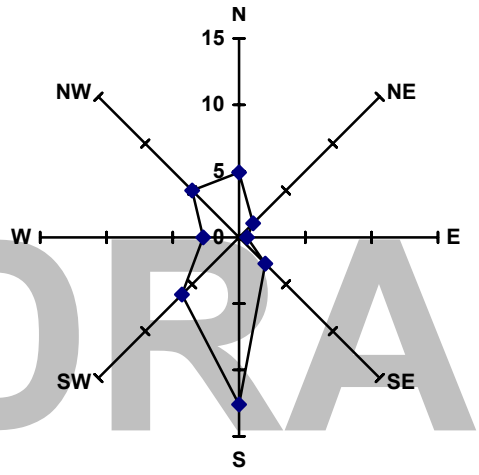

Fig.2 – The Main Direction of the Winds

The maximum frost depth is 0.80mm, and the average frequency of frost days with T≤0°C is 136.6 days/year.

3.5 Geo-technical Ground Properties

Boreholes show the following distribution of the layers (considering the average layer depth):

- the vegetal soil - down to the average depth of 0.40m,
- the clay layer - down to 1.20m,
- the gravels & sands, under the clay layer.

The average depth of the bedrock is 1.50m, with an average conventional pressure (for computation purposes) of 300KPa.

In the case of new construction or any works to the existing ones, the laws in force require that each design stage includes a geotechnical study for each individual location. Based on this the geotechnical properties of the bedrock are to be determined, and the foundation system to be designed accordingly.

3.6 Seismicity

From a seismic point of view, the location belongs to the seismic computing area "E", with a coefficient ks=0.12 and a corner period Tc=0.7sec.

4 THE GEOLOGY OF THE REGION

Aninoasa perimeter belongs to Valea Jiului epistructural basin. A number of metamorphic and sedimentary accumulations contributed to its geological formation, and accounts for its very special features if compared to the other depressions located in the South Carpathians.

Petrosani Depression is a distinct unit of the South Carpathians. It comprises a crystalline basement on which a sedimentary cover was transgresively and discordantly deposed in the Upper Cretacic, Paleogen and Neogen.

The crystalline basement, which was intercepted on the occasion of mining and drilling, appears at the surface along the basin frame and it is made of rocks belonging to the Getic and Danubian Autochthon Nappes. The two crystalline areas have different lithologic profiles, in terms of metamorphic grade, which is higher in the Getic Autochthon Nappe (gneiss, quartzite, mica-schists and amphibolite) and it is lower (epizone rocks) in the Danubian Autochthon Nappe (chlorite-schists, sericitic schists and crystalline limestones).

Upon the metamorphic formations, some sedimentary deposits appear in detritic facies (sandstones, conglomerate); they belong to the Upper Cretacic, the Paleogen and the Neogen. From the structural and lithologic points of view, the Paleogen and Neogen deposits were divided into the following litostratigraphic horizons:

The Basal Horizon (Ruppelian) is built up of breccia and conglomerate with reddish-greenish (sometimes whitish) argillaceous matrix, greenish-reddish and grey sandstones, grey-reddish clays and rarely dark-grey or yellow lacustrine limestones. In general, this horizon has no fossil record, except for the upper area, where rare fauna remains could indicate the transition to the Productive Horizon.

Different types of grey or green sandstone with clay-rich cement, grey or dark-grey marl and clay, grey clay with calcareous and ferruginated concretions and

grey-yellowish marl-limestones contributed to the lithologic formation of this horizon.
Within this series, the boreholes crossed 22 seams of coal (from 0 to 21), different in size and thickness, the whole productive horizon being 250-500m thick.

At different levels the remains of fossil fauna and flora are a good guide when determining the correlation of the coal seams.

The Middle Horizon (Neogene) is represented by the Activian Horizon, which covers the largest area of the basin. It is basically made of grey-greenish sandstones with intercalations of microconglomerates and conglomerates based on quartz and grey-greenish clay, with rare thin layers of coal or coal powder-bearing clay.

The Quaternary presents well developed depositions along Valea Jiului and it is represented by alluvial terraces and plains one could see along the main tributary streams, too.
The discard cones appear at the junction of Valea Jiului with some small torrential rivulets.

4.1 Geology of the Deposit

The coal deposit within Aninoasa mine perimeter is located in the centre of Petrosani basin, neighbouring the mine field Vulcan (to the West), and the mine fields Dalja and Iscroni (to North-East and South-East respectively); the mine field is located on the territory of Aninoasa city.

Petrosani basin forms a distinct geological unit within the South Carpathians, comprising a sequence of alternating crystalline schists and low methamorphic grade paleo-mezozoic formations.

4.2 Stratigraphy of the Deposit

From the stratigraphic point of view, the whole region consists in two structural units:

- a lower structural unit consisting of the autochthon crystalline and the Getic Nappe
- an upper structural unit consisting in sedimentary deposits of Cretacic and Tertiary ages, and belonging to the basin itself.

The Autochthone Crystalline occupies the border area of the basin, in close contact with the sedimentary deposit, where the Getic Nappe is missing. This formation has quartzite and crystalline limestones.

The Getic Nappe consists of crystalline series of Mesozoic metamorphism, shaping the south-eastern and partially the northern sides of the basin. From the petrographical point of view, the Getic Nappe consists of gneiss and mica-schists, and only subsequently the amfibolite, quartzite and ophiolite.

The Jurassic developed into large areas, as it consists in massive white unlayered limestones.

The Cretacic (Devonian) developed into two areas in the East of the region, and it consists of marl, clay, conglomerate and limestones with marl.

The Middle Oligocen (Ruppelian) – the basal horizon – forms a variable width band with small interruptions along the entire South and East sides of the basin. The basal horizon is almost continuously visible at the northern side, from the Boncii brook to the East. From the petrographical point of view, the basal horizon is made of clay, greenish-reddish sandstones, and polygenetic conglomerates.

The Upper Oligocen (Chattian) – the productive horizon – is the most important formation of the basin, the deposits accommodating the coal layers. The lithologic composition comprises the clay, the marl, and the sandstones, as well as the marl-limestones rich in fauna and flora fossils. The coal layers developed over large areas, with thickness varying from a few centimetres to a few tens of meters.

The Acvitian – the upper horizon – cover the largest area of the basin, comprising marl, sandstones, and conglomerate.

The Burdigalian – which is the marl-clay Salatruc horizon, has been developed only along Salatruc brook; it consists of clay, marlstones, sandstones, conglomerate, and some coal intercalation bands.

The Helvetian has been developed in the South-East end of the basin and it is represented by gravels, sands and boulders.
The Basal Horizon bassets in the South and North sides of the mine field, in the form of a band of variable width. The thickness of this horizon reaches up to about 300m, and it was present in any drilling in this mine field.

The Productive Horizon – is the most important horizon from the economic point of view, and it accommodates the coal seams which are actually mined. The thickness of the deposits varies from 150m to 450m.

The Upper Horizon covers the largest area of the zone and it continues the sedimentation process upon the productive horizon. The thickness of this horizon is about 550m in the North of Jiul de Vest, and it is about 330m, in the South.

4.3 Description of the Coal Seams

The productive formation within the framework of Aninoasa mine comprises 20 layers of coal, numbered from 0 to 19.

The coal seams in the sedimentation order are:

- Layer 0: is located at 20-40m above the limit of the basin, and it is 0.09-0.57m thick;
- Layer 1: is located at 5-7m above the Layer 0, and it is 0.57 to 1m thick;
- Layer 2: was found in almost all drillings, and its thickness varies from 0.25 to 4.50m. The top cover of the layer comprises alternating clay and marl structures, rich in fauna fossils, while the basement is of <argilo-greseuse> rock (clay with fluvio-lacustrine sandstones).
- Layer 3: is the most important one from the economic point of view, and it is located at 30-50m from the basal-productive separation line. It is a complex layer, comprising an alternation of coal beds and unproductive material bands, along a stratigraphic distance of 30-45m. The coal is compact towards the top of the layer, and it accommodates a lot of unproductive material to the basement.

  The intercalation bands get thicker in the southern flank, and the layer splits into 2-3 coal beds, of which only 1 or 2 can be mined. So, the useful thickness reaches 25m in the northern flank, and it decreases to 1-7m, in the southern flank.

  The top cover of the layer comprises striped grey clay-rich sandstone, as well as flora fossils, which are passing from the fine compact <argilo-greseuse> rock directly into the top cover. The basement of the layer is partially made of clay and siliceous sandstones.

- Layer 4: is located at 30-40m inside the top cover of Layer 3, in blocks I – II, and at a distance of only 2-3m, in block III. This is a compact layer, showing a thickness of 1 to1.50m in mining works and of about 2m in drillings. It gets thinner in the northern flank, i.e. down to 0.50m, towards the syncline axis, except for “block 0” where it reaches the maximum thickness.

  The top cover of the layer is of fine <argilo-greseuse> rock with flora fossils, while the basement is made of dark grey clay, turning progressively into sandstone.

- Layer 5 is located at about 30-40m inside the top cover of Layer 4. The northern flank is composed of 3 beds separated by unproductive material bands. The lower bed is 2-3m thick, the middle one is 1.50-2m, and the upper bed called “Paprica” is 1m thick. It gets thinner in the area of syncline axis, while the rest of the field gets rarely to the thickness of 1m.

  The top cover of “Paprica” bed is made of <argilo-greseuse> (sometimes calcareous) marls, with clay intercalations comprising fossils flora. The basement is made of clay, which is turning progressively into sandstone with clay-rich cement.

- Layer 6: has a useful thickness of 0.50 to 1m, and it consists in two beds separated by an intercalation band of limestones with marl, of about 1.50m. In the operation area the thickness gets to about 0.80m, while the layer disappears at all in the syncline area, to appear in isolated spots, in the South. The top cover is made of clay with fossil fauna, while the basement rock is made of sandstone.

- Layer 7: is underdeveloped, with thickness varying from 1 to 2m, and down to 0.50m in the syncline area. It is located at 15-35m above Layer 6 and it comprises 1 or 2 coal beds.

  The basement is made of dark grey clay, while the direct basement is made of limestones with marl. The top cover is made of clay with fossil fauna.

- Layers 8 and 9: are separated by 2-3m thick a band of unproductive material, in the northern flank, which gets to the thickness of 10-20m, in the southern flank. In the North, the cumulated thickness of the layers is from 0.80m to a little more than 1.50m, while in the middle, the layers thickness gets down to 0.20m till disappearing. In the South, the thickness of Layer 8 is 0.20-3.50m, and that of Layer 9 is 0.20-1.50m. The unproductive intercalation bands in-

between the layers comprise <argilo-greseuse> rock with fossil fauna. The basement of Layer 8 is made of clay and limestone with marl, while the top cover of Layer 9 is made of clay with fossil fauna.

- Layer 12: is located at about 100m in the top cover of Layer 9, and it is made of a single bed of clay-rich coal or coal powder-bearing clay; it is not uniform and it has tones of sedimentary stuff.

- Layer 13: of Aninoasa field is deemed to be a thick layer, with generally uniform development. The thickness of the layer is from 3 to 5m in mining, while it reaches about 4.50m in drillings. It goes down to 0.20m in the centre, and it gets again to the mining level of 1-4.50m, in the southern flank.

  The top cover is made of hard rock of limestone and marl, with micro-fauna. The basement of the layer is made of dark grey clay, which turns progressively into <argilo-greseuse> rock and siliceous sandstone.

- Layer 14: is located at 10-35m inside the top cover of Layer 13, and it is only 0.35-1m thick. The top cover is made of clay with fossil fauna, while the basement is made of clay with sandstone bands.

- Layer 15: is located at 20-40m in the top cover of Layer 14. It comprises 2 coal beds separated by a clay intercalation band, 0.50m thick. The useful thickness of the layer is 0.20-1.50m in the exploitation area; it is 0.20-1.20m in the remaining field up to River Jiu, while the layer disappears at all in the centre area. The basement of the layer is made of argillaceous sandstones, and the top cover has fossil fauna.

- Layer 17: is located at 40-60m inside the top cover of Layer 14, and it is 0.20-1.50m thick. The sedimentary material is missing in the central area and in some areas of the southern flank. The basement is made of very crumbly clays, while the top cover is made of <argilo-greseuse> rock with fossil fauna.

- Layer 18 is located at about 25m inside the top cover of Layer 17. The thickness of the layer dealt with when mining is up to 1m. It gets thinner in the centre and to the border of Block II mining area, while the rest of the layer in the northern flank is 1-1.50m thick. From the shafts in the South and further along Aninoasa brook, the layer gets thinner and thinner down to 0.50m thick, while its average thickness is 0.80m in the South flank. The basement is made of argillaceous sandstones, while the top cover is made of clay with fauna fossils.

Before closing down Aninoasa mine, the works were carried out alternatively on Layers 3, 4, 5, 7 and 13, as they were the most important ones, from the economic point of view.

4.4 Hydrology of the Deposit

The deposit is located between a number of compact rocks at sufficient depth to act as a protection screen against the groundwater, either collected from the downhill slopes or accommodated in the valleys of constant flow rivers and brooks. The only possibility for such deposit to get infiltrated is via the old mine works.

Except for the aquifer groundwater horizons in the surface terraces and alluviums, there are no permeable rocks to collect the underground waters, either within the deposit or close to it.

4.5 Tectonics of the Deposit

It is very complex as it shares the general characteristics of Petrosani basin.
The direction of the layers is approximatively East - West, with different gradients from a flank to the other, like 30-35 degrees in the northern flank, and 10-15 degrees, in the southern flank. The deposit is bordered by the marginal northern fault, to the North, and Jiului Fault, to the South. In the northern flank of the syncline, the tectonic blocks expand almost next to the syncline axis, close to which the longitudinal faults that appear are crossed by block transversal faults. The entire southern flank is fragmented and unlevelled, from the North to the South, due to a number of longitudinal faults crossing the whole mine field.

From the East to the West, the faults divide the deposit into several blocks.
- block 0, between Aninoasa and Lazului Faults;
- block I, between Lazului and Piscu Faults;
- block II, between Piscu, Hansu and Plesnitoarea Faults;
- block III, between Hansu and Plesnitoarea Faults;
- block III West, to the west of Plesnitoarea Fault;
- block IV, between Aninoasa and Deleriu Faults;

Block 0 is 400-500m wide in the northern flank, and about 1200m wide in the southern one. It is subdivided by means of some longitudinal faults. Scoabei Fault, in the South, raises the deposit with more that 100m along its entire width and with about 400m along its length.

From the northern flank to the South of the syncline axis and of the well no. 5363, this block shows continuity for about 1600m a length.

- Block I is 350-500m wide and it is further divided into three compartments, by several longitudinal faults.

  The compartment length to the syncline axis zone is about 1000m, for the North compartment, abut 300-500m, for the South compartment (which North – South oriented), and about 800m, for the South compartment (if measured up to Jiului mining area).

- Block II is 150-900m wide and it is divided into two compartments by Mogonarilor Fault.

- Block III is 500-900m long and 200-250m wide, and it is bordered by Hansului and Plesnitoarea Faults, in the South.

- Block III West is located between the Plesnitoarea Fault, Hansului Fault, and the eastern Fault of Block X Vulcan. It is 300-350m wide and about 500m long. The block is accommodating the resources of Layers 3, 4 and 5.
- Block IV is located in-between Aninoasa, Deleriu and Coroesti Faults, and the border of the mine perimeter in the North. It has the shape of a triangle whose sides are 400, 500 and 700m long.

  Excepting for the faults exposed by drilling and mining, there are a number of other smaller magnitude faults that affect only certain seams of the deposit.

5 THE HISTORY OF ANINOASA MINE

The documents at the end of the XVII-th century indicate the presence of coal. The local blacksmiths used it for manufacturing tools..

The first primitive attempt at coal mining in Jiu Valley was carried out from surface outcrops, in 1840. However, the records show that “Societatea Anonima de Mine si Furnale din Brasov” (The Anonymous Society of Mines and Furnaces in Brasov) located in Wien was the first company to start exploring (in 1850) and then exploiting the coal in Jiu Valley

In 1854, the Law of Mines in Austria-Hungaria forced the small owners to unite into larger companies. It was the time when Transilvania de Vest (West Transilvania) was established, which was then bought by “Societatea Anonima de Mine si Furnale din Brasov”, in 1858.

In 1870, after building a couple of high furnaces in Calan and especially after finishing the railway Simeria-Petrosani, several mines like Lonea, Petrila, and Dalja opened, while the preparation works started in Aninoasa, in view of coal mining in Layers 3 and 5 bassets. Kelti mine was the first to open, and then Piscu and Priboi, in 1871.

The records in “The Concessions Register” of Capitalul Minier pentru Transilvania (The Mine Capital for Transilvania), which is kept by The State Archive – Deva, prove that coal mining in Aninoasa started actually in 1885, fact which is officially confirmed by the Monograph of Aninoasa City. In 1890, the first wooden aerial rope way was built and put to work in Aninoasa, for the transportation of the coal from Aninoasa to the separation unit of Petrosani Vest mine.

This was possible as steam power was put to work, which helped the progress of coal transportation, too. The aerial rope way, which spans a length of 4000m through the area, was installed by Obach Company, using a steam mono-cylinder machine, in 1892. When installing the aerial rope railway they crossed 23 degree a valley, and some other three valleys, with large openings. Three stations for tightening the rope were installed on top of three hills beneath the railway.

The construction of Petrosani-Lupeni railway started in the same year, and it was finished in 1892.

The documents relates about several operational mines in Aninoasa from 1890 to 1894, i.e. Aninoasa Est, Aninoasa Vest, Valea Plesnitoarei si Priboi.

In 1897, the government rent the mines and the equipment that belonged to them to “Societatea Anonima de Mine si Furnale din Brasov”.

After 1931 and through the mergence with Lupeni Society, Petrosani Concern took control of all the large mines in the Jiu Valley, Aninoasa included.

In 1938, the first trolley-locomotives were introduced, starting to gradually replace the underground transportation by means of horses.

In 1940, Aninoasa and Piscu horizons merged into a single operation named Aninoasa; between 1962 and 1965, the first hydraulic pillars with individual pumps are implemented in the mine. In 1977, they use for the first time a complex mechanised supporting structure.

6 DEVELOPMENT OF ANINOASA MINE

For the pit deposit in Aninoasa mine field to open, they took into consideration a series of complex geological and mine specific factors, as well as technical and economic ones, including the self-igniting feature of the coal, by applying "The method of opening a package of severe gradient and various thickness strata, through drilling vertical shafts (into the deposit basement) and transversal main galleries on each storey".

In order to avoid undermining top seams by the bottom seams, the deposit was opened simultaneously on two or more levels, which made it possible to start mining the thin seams in advance.

In Aninoasa mine (the main precinct), there is a shaft, which was drilled from the surface in 1935. The main North Shaft – located in Aninoasa Nord – has the free-diameter of 5m, between surface (level +667.5) and horizon XII (level +50.0), i.e. for 617.5m a depth. The extraction equipment comprises among other components (accessories) an extraction machine type CD-600, with a d.c. Koepe wheel, located at the ground level, and a power generator.

6.1 Main Characteristics of Aninoasa Mine

Aninoasa Mine is located on the northern side of the deposit, westwards of the Aninoasa River. The curtilage encompasses buildings for industrial mining activities, as well as social, welfare and administration needs.

The long period of exploitation and the different methods and locations of production over time have resulted in different industrial and civil buildings being built and new sections being added to existing buildings.

Thus there has been a great deal of historical activity at the mine as evidenced by the different ages of the buildings on site.

Because of the exhaustion of the coal deposit, this mine was included in the national plan for closure and ecological rehabilitation of the mines. At the time of drawing up this documentation, the only activity of the mine was the withdrawal of functioning equipment and machinery from the underground and surface.

Therefore, part of the old buildings (the headgear, the winding engine house, the pit top building, part of the social-administrative building) are still in use, even though they are in a state of deterioration.

The other older buildings, which have fallen into disuse after production was finished, were abandoned, being effectively derelict (the old workshop buildings, part of the extraction shaft circuit, the locomotive shed, the training school, different depositing areas, warehouses, etc.).

The following describes the existing buildings within these premises (see the attached situation plan PS01):

the building "bathrooms, lockers" (position nr.1 in the situation plan PS01) is a new building from the period 1984 – 1986, whose height is G + 3F in a plane section, it has a regular rectangular shape with the external dimensions of 12,30 x 48,33 m, and covering a built surface of around **Bs = 594,459 m^2** and a total height of approx. 14,00 m, measured from the floor level at the ground floor; the load-bearing structure is mixed, comprising masonry structural walls and as well as frames made of prefabricated elements of reinforced concrete, having 2 openings and 8 segments, all having a length of 6,00m; the perimeter and different interior compartments comprise structural walls made of brick masonry, reinforced vertically by reinforced concrete kernels 30 x 30cm, at the intersection with each segment and perimeter belt on the upper part of each level (strengthening also the connection with the floor of each level); the frames of prefabricated elements consist in central pillars, placed at the intersection of the longitudinal axis with each segment and the two marginal kernel of reinforced concrete, connected to the upper part by the transversal beams, and longitudinally the pillars are connected to prefabricated longitudinal beams, ensuring thus an enforcement on both levels; the floors are made of prefabricated bands with spaces, made of reinforced concrete, unified in the leaning points; the roof is "platform" type, with thermo and hydro isolation, equipped with a surrounding roof edge; the foundation system is made of prefabricated foundations type "glass" for the central prefabricated pillars of reinforced concrete, and for the structural walls made of brick masonry, continuous foundations made of simple concrete block with reinforced bush on the upper part;

the canteen (position nr. 2 in the situation plan PS01) is connected to the South-Eastern side of the "bathrooms, wardrobes" building, a joint (anti-seismic and dilatation) and between the two buildings; according to the data we have, it was built between 1990 – 1992, with a height of G + 1F and a total height of around 8,80m, measured from the floor line of the ground floor; it has a regular plane shape, with external dimensions of 18,50 x 48,90 + 6,40 x 6,55 - m, and a built surface of **Bs = 946,57 m^2;**

the load-bearing structure consists in frames of prefabricated elements made of reinforced concrete having 3 openings of 6,00m each and 8 segments of also 6,00m each, made of lateral pillars with a section of 40x75 – cm and central pillars with a section of 40x40 – cm, transversal beams of 35 x 80 – cm and longitudinal beams of 35 x 50 – cm; the ground floor has a useful height of 2.90m, with the ceiling made of prefabricated bands of reinforced concrete, unified in the leaning points; the first floor has the useful height of 4,00m, and the frames continue only with the marginal pillars (practically having only one opening of 18,00m); the roof of the floor, which is the roof of the building, is "platform" type, made of prefabricated elements encased by the roof with an 18,00m opening and the width of 1,50m unified on the leaning points by a belt made of reinforced concrete, with thermo and hydro isolation at the upper part and having a surrounding roof edge; the foundation system is made of prefabricated foundations type "glass" for the prefabricated reinforced concrete pillars, connected on both directions with continuous foundations as a reinforced concrete bush.

the lamp room (position nr.3 in the situation plan PS01) is also connected to the "bathrooms, wardrobes" building, but towards the end of its South-West side; it seems to have been built between 1984 – 1986, with a height of G +1F and partially only ground floor (the access corridor towards the administrative headquarters); it has a maximal height of around 7,20m, measured from the level of the finished ground floor; it has a regular shape in plane, with the external dimensions of 12,30 x 42,60 - m , covering a built area of **Bs =** 523,98 ≈ **524,0m^2**; the load-bearing structure is made of brick masonry structural walls with prefabricated kernels and belts of reinforced concrete, and on the longitudinal direction, in the centre, there is a line o prefabricated concrete pillars, joined to the rest of the structure through transversal and longitudinal prefabricated beams, also made of concrete; practically, the structure has two openings of 6,00m and 7 segments also of 6,00m each, both levels having an useful height of 3,40m, the ceilings being made of monolith reinforced concrete, the one at the last level being poured in two slopes; the first three segments towards the "bathrooms, wardrobes" building have a height of G +1F, and in the rest of the segments the structure continues only at the upper part because of the land slope; the foundation system is made of prefabricated foundation type "glass" for the prefabricated pillars of reinforced concrete, and for the brick masonry supporting walls, continuous foundations made of concrete block with reinforced bush;

the access corridor (position nr. 4 in the situation plan PS01) is a supra-terrestrial construction connecting the lamp house and the administrative headquarters; this corridor has a external width of 3,30m, a total length of 47,00m, measured on horizontal level and a total height of 3,60m measured according to the surrounding built area; its load-bearing structure is made of supporting brick masonry walls, reinforced by kernel of reinforced concrete, at the upper part having belts and a ceiling of monolith reinforced concrete; the foundations are made of concrete, continuous under the walls – block and bush– and the floor is also made of concrete; all along this corridor there are five ramps each having 10 steps of 32,50cm – width x 17,50cm – height, covering the difference of level between the two buildings it connects; the corridor covers a built area of around **Bs =** 3,30 x 47,00 = **155,10m^2;**

the administrative building (position nr.5 in the situation plan PS01) is a building consisting in more blocks of buildings, with different features and heights, built at different stages along the history of the mine, according to the needs of production process; in plane, the building ha a polygonal shape, with the maximal external dimensions of 39,50 x 63,50m and covers a built area of **Bs =** 10,50 x 15 + 18,50 x 48,50 + 10,50 x 38,25 + 15 x 11,75 - m = **1632,625m^2**; in the following we will describe each identified block of building:

the main block – it seems to have been built in the first stage, around 1936-1938, being composed of two pieces of building connected under an L shape, having the same structural resistance system, made of supporting brick walls, reinforced with kernels and belts of reinforced concrete, ceilings of reinforced concrete, continuous foundation of concrete under the walls; the western corpus, with the main entrance in the administrative building, has a height of U+G+1F and in plane has a rectangular shape, the access being done through a lateral staircase; the internal division is made in such manner that the room are placed on the perimeter with access through a central hall at the underground level, and at the ground and first floor through surrounding corridors, the central area being empty for a natural illumination purpose, done through an illuminator placed at the last level; this has a pyramidal shape and is made of glass eyes set on a metallic structure; the other corpus, on the south-western side is also rectangular in plane having the same height of U+G+1F, the internal division being a cell type; the global height of the two corpuses, at the level of the reinforced concrete roof – type “platform” – is around 10,50m, and at the cupola is 10,00m;

the deployment centre – is a construction a little bit out of the structural conventions of the buildings on the premises, both through the shape and structure of the roof ceiling; it seems to have been built also around 1936 - 1938, it has a rectangular shape in plane, with external dimensions of 12,00 x 18,00m and a height of Ground floor; the load-bearing structure is made of reinforced concrete frames with one opening of around 12,00m, and on the transversal direction, with 6 segments of 3,00m each; the roof is basically a semicircular cupola, with a transversal discharge, resulted through a thin layer of reinforced concrete and strengthened through a net of reinforced concrete veins placed on two orthogonal directions; correlation on both directions of the building is given by the surrounding beams, attaching the roof to the rest of the structure; the lateral closings of the walls are made of brick masonry, and for the roof, on the transversal direction by two semicircular tympana; the maximal height of this building corpus is around 6,30m, measured according to the finite internal floor.

connected annexes – on the southern side, between the call-over room and the rest of the building, there is an annexe with a height of Ground floor, having a load-bearing structure made of supporting masonry walls, roof in one slope, made of monolith reinforced concrete; it has the external dimensions of approx. 6,00 m x 10,00 m and a total height of 5,00 m, measured according to the floor of the call-over room; also, on the northern side a series of annexes was added; their structure was made also of supporting brick walls, with roof type “platform” made of reinforced concrete; this area has a height of Ground floor, with a height of 3,30 m, with only one area with height of G + 1F, whose height is around 6,60 m, according to the ground floor;

Presently these connected buildings, forming an administrative headquarters, are in an advanced stage of decay;

the training room (position nr.6 in the situation plan PS01) covers a built area of **Bs =** 18,00 x 22,00 = **396,00m^2** and has a height of G+1F, with a total height of around 9,80 m, measured according to the finite floor level; it is one of the very old buildings, presently being a ruin; its structure is made of supporting brick walls, with reinforced concrete roofs; the infrastructure seems to have been made of continuous concrete foundations under the walls;

water reservoir (position nr. 7 in the situation plan PS01), on the ground, it covers a built area of around **Bs = 70,90m^2**, having an external diameter of approx. 9,50m, being a circular water reservoir made of reinforced concrete;

the gate cabin (position nr.8 in the situation plan PS01), covers a built surface of **Bs =** 4 x 6,25 = **25,00m^2** and is a building with a height of Ground floor, and a total height of around 3,00m; it has a load-bearing structure made of reinforced concrete frames (pillars and beams) with a roof of reinforced concrete, the lateral closings made of brick masonry. The infrastructure is supposed to have been made of isolated foundations type block and bush reinforced under the pillars, connected on both directions with continuous foundation beams, and the floor is concrete;

cooling tower (position nr. 9 in the situation plan PS01), covers a built area of **Bs =** 6 x 7 = **42,00m^2** and a height of around 10,00m, measured according to the level of the surrounding built area; it is a specific industrial building having a stack with a spatial shape of thin parallelepiped cloth of reinforced concrete, with an internal load-bearing structure made of pillars and beams of reinforced concrete; the infrastructure is made of a half buried basin of reinforced concrete;

water tower (position nr.10 in the situation plan PS01), covers a ground built area of **Bs = 24,63m^2**, having the base external diameter of 5,60m and a total height of 37,00 m, measured from the surrounding built area; this water tower is a specific industrial building with a total water volume of 500m^3 and the load-bearing structure consisting in a vertical element with a transversal circular section as a cloth of reinforced concrete, which supports the reservoir with a truncated cone shape and the structure made also of reinforced concrete with a maximal external diameter of around 18,00m;

Boiler House (position nr.11 in the situation plan PS01), is a building locate in the proximity of the administrative headquarters and supplies the hot water for heating the premises and for the bathrooms and wash rooms; the building has a height of Ground floor , in plane has a rectangular shape with external dimensions of 14,50 x 19,50m and a total ground built area of **Bs = 282,75 m^2**; the load-bearing structure is made of supporting brick walls, strengthened by reinforced concrete kernels and surrounding belts, having the roof made of reinforced concrete “platform” type and continuous concrete foundations under the walls; it has a total

maximal height of around 5,20m, from the ground floor and is in an advanced state of decay;

Old workshops group (positions nr.12,13,14 in the situation plan PS01), in an ensemble of old buildings with a Ground floor height, attached one after the other on the north-western side of the premises; their load-bearing structure is similar, being made of supporting brick walls, reinforced concrete roof with surrounding belts, the foundation system being made of continuous concrete foundations under the walls; In the following we will describe those workshops one by one:

fire fighting shed (position nr.12 in the situation plan PS01) – has the external dimensions of 13,25 x 14,25m, a height of Ground floor and a total height of around 3,20m and covers a built area of **Bs = 188,82 m^2**;

electric workshop (position nr.13 in the situation plan PS01) – has the external dimensions of 8,50 x 24,50m, a height of approximate G + 1F, covering an area of **Bs = 208,25 m^2**; the load-bearing structure is made of reinforced concrete frames with two openings of 4,00m and 5 segments two of 6,00m and three intermediary of 4,00m; the intermediary floor is made of reinforced concrete and the roof is made of prefabricated elements; the global height of the building is about 7,80m; the infrastructure is made of isolated foundations under the pillars, type "glass" of prefabricated reinforced concrete, connected on both directions by foundations beams;

workshop for locomotive maintenance (position nr.14 in the situation plan PS01) has the external dimensions of 16,50 x 30,50m, height of G + 1F, covering a ground built area of **Bs = 503,25 m^2**; the roof over the ground floor is made of concrete in one slope and at the first floor the roof is poured in two slopes; the global height of the building is around 5,10m, the height of each level being 2,40m;

Inside these buildings remain massive concrete foundations which belonged to different machinery used in the mine.

the compressor station (position nr.15 in the situation plan PS01), was used for housing the different equipments producing compressed air for the extraction machine of the pit in the Aninoasa mine; it is a building with a height of G + 1F, with a rectangular shape in plane, whose external dimensions are 9,50 x 18,50m, covering a built area of **Bs = 175,75 m^2**;

the load-bearing structure is made of prefabricated elements of reinforced concrete (pillars with consoles, longitudinal and transversal beams) with an opening of 9,00m and three segments of 6,00m each and closing made of brick masonry; the roof is a reinforced concrete plaque, type "platform", on the short side having two roof edges, with three steps on the height; the global height of the building is approximate 5,70m; inside the building remain the massive foundations of the machinery belonging to this station (compressors, intermediary reservoir, final reservoir), and outside there are four buffer recipients, also sitting on massive foundations type concrete block;

electro-mechanic workshop (positions nr.16, 17, 18 in the situation plan PS01), is a relatively new building, from the years 1982 – 1985, but whose maintenance was inappropriate; structurally consists in two joined halls, but different both functionally and dimensionally; the external dimensions of this building are 31,05 x 12,55 + 18,45 x 48,75 + 5,70 x 12,50 + 6/2 x (5,70+2,70) + 2,90 x 6/2m and the global built area is **Bs = 1394,265m^2**; in the following we will describe separately each area:

the electric workshop hall (positions nr.16 in the situation plan PS01) – is an industrial hall with an opening of 12,00m, 5 segments of 6,00m each and an internal height of 9,30m, reaching a maximal external height of 11,11m, measured from the level of the internal floor; the structure consists in prefabricated pillars made of reinforced concrete at +6,00m from the ground level, with consoles with prefabricated beams having a "T" section, type GR6-60A; the pillars from the longitudinal marginal axis have only one console and a transversal section of 45 x 60cm, and the pillars on the axis shared with the other section of the workshop have two consoles and the transversal section of 45 x70cm; the roof is made of prefabricated elements type ECP 1,5 x 12a, unified at the ends with the lateral prefabricated roof edge beams, type GA; among these caissons there are triangular rooflights TZ3 with a length of 9,00m; on the lower parts of the building the lateral walls are made by a 25cm thick brick masonry, and between the façade windows by b.c.a. striped type panel GO600x20D;

the mechanic workshop hall (position nr.17 in the situation plan PS01) – has the external dimensions of 18,45 x 48,75m, being an industrial hall with the opening of 18,00m, 8 segments of 6,00m each and an internal height of 9,30m, with a maximal height of 11,36m measured from the internal floor level; the load-bearing structure has the same features as

above, practically being another opening of the same construction; the prefabricated pillars have consoles on which rely the same type of prefabricated beams; the pillars of the longitudinal marginal axis have one console and the transversal section of 45 x 60cm, and the pillars on the common axis with the second section of the workshop are those having two consoles, described above; on the first segment, the construction has also pillars and intermediary beams of monolith reinforced concrete, so that, in this area the construction is separated both at the ground and the upper floors (the height being G + 1F); the intermediary roof is partially made of monolith reinforced concrete and partially of prefabricated concrete stripes; the maximal height of this section is 7,90m; for the rest of the building the maximal height is 11,36m, the roof being made of prefabricated roof elements type ECP 1,5 x 18a, united at the edges with the prefabricated roof edge beams type GA; between caissons are placed triangular rooflights TZ3 with the length of 15,00m; the lateral walls are made of 30cm thick brick masonry;

the tools hall (position nr.18 in the situation plan PS01) – in plane, has a irregular polygonal shape with external dimensions of 5,70 x 12,50 + 6/2x(5,70+2,70) + 6/2x2,90m; this section is found in the last segment on the south-western side of the mechanic workshop; as in the other edge segment, here also there is internal partition made of brick walls, intermediary roofs made of prefabricated roof elements alternating with monolith areas, and over the last level there are prefabricated concrete stripes; the maximal height of this section is 7,90m;

The infrastructure of the whole ensemble is made of isolated foundations under the pillars, type concrete block and reinforced bush, continuous foundations under the walls and connections between the pillars foundations, on both directions (transversal and longitudinal) also made of simple concrete block and reinforced bush;

Winding engine house (position nr.19 in the situation plan PS01) is built probably around 1950, for housing the extraction machine of the main shaft Aninoasa North; it has a regular shape in the plane, with external dimensions of 20,60 x 20,20m, the height being S+G and a maximal height of 14,75m, measured from the finite floor level and covers a built area of **Sc = 416,12m^2**; the load-bearing structure is made of prefabricated enforces concrete frames with two openings – one of 7,00m and the other 12,00m – and 6 segments 3,30m each; the pillars have the transversal section of 30 x 50cm, having intermediary consoles supporting

longitudinal prefabricated beams with a transversal section of 35 x 70 cm, the pillars on the central axis having two lateral consoles; on the upper side, the frames are connected on both directions through transversal and longitudinal beams of monolith reinforced concrete, over which is poured a roof in two slopes; the surrounding walls are made of brick masonry, and at the semi-basement level they are made of reinforced concrete walls; practically the semi-basement is part of the building's infrastructure, conceived as a rigid box o with 40cm thick reinforced concrete walls, overall raft, hosting all the massive foundation of the extraction machine;

Pit Top Building (position nr.20 in the situation plan PS01) is also built around 1950 in order to host the main shaft of Aninoasa; it has a regular shape in the plane, with external dimensions of 12,50 x 10,20m, , the height being Ground floor, with a maximal height of 5,70m, measured from the level of the surrounding built area; it covers a built surface of **Bs = 127,50m^2** and its load-bearing structure is made of monolith reinforced concrete frames, with an opening of 12,00m and three sections of 3,30 each; the pillars have the transversal section of 30 x 50cm having on the upper part, on both directions, longitudinal and transversal beams of monolith reinforced concrete, over which is poured a double sloping roof plaque; the surrounding walls are made of brick masonry, and the infrastructure consists in isolated foundations under the pillars, made of concrete simple block and reinforced bush, and under the walls continuous foundations, consisting in concrete block and bush which includes also the pillar bushes; the roof presents a gap surrounded by secondary beams, through where comes out the high structure of the extraction tower;

Head Gear (position nr.21 in the situation plan PS01) is a building specific for the mining industry and is used to lower the cages within the vertical shaft, supporting the equipment (rails and their accessories) required for the transportation within the shaft; this tower is maximum 25,00m high, with a mixed load-bearing structure, made partially of reinforced concrete, and partially of steel structural elements (various laminated profiles); thus, reinforced concrete part of the structure is oriented towards North-West and comprises a central prop, a inclined buttress, both supporting on the upper part a concrete platform, situated at level +17,50m from the shaft collar; the prop is conceived as a frame made of two pillars connected through beams; the buttress is in fact another frame, inclined in comparison with the central prop's vertical, made of two inclined branches, connected transversally through a system

of horizontal and inclined beams; on its upper part, the reinforced concrete plaque discharges on this structure through two beams practically tying up the edges of the prop pillars and the connections of the buttress; the metallic structure of the tower is oriented towards North-South, comprising, like the concrete one, a central prop and a buttress, but the upper part has two superposed platforms in order to sustain the rails; both the central prop and the buttress are a spatial structure made of laminated profiles, with various diameters and dimensions; the platforms level is above the concrete plaque level at + 19,00, respectively +22,15; from the level of the tower house roof until level +17, the tower has surrounding walls made of brick masonry; the foundations of the prop elements are made of continuous concrete beams, poured around the shaft collar and the foundations of the buttress are made of massive concrete blocks;

Pit top wagon circuit building (position nr.21 in the situation plan PS01) is a building with the height of Ground floor, reaching a maximum height of approx. 5,00m, measured from the level of the surrounding built area, hosting part of the trolley circuit around the shaft; a circuit goes around the western side of the tower house, and the other, on the second side of the building; the load-bearing structure consists in masonry walls, concrete blocks, equipped with belts on the upper side and intermediary with concrete kernels; the roof is made as a double sloping wooden framework, covered by asphalted cardboard; the construction has the external dimensions of 16,0 x (17 + 50,00) - m, covering an area of **Bs = 1072,00m^2**; its infrastructure consists in continuous foundations under the walls of concrete blocks and bush;

old workshop (position nr.23 in the situation plan PS01) is an old building in an advanced stage of decay; it has a G + 1F height, the global height of the building being approx. 6,70m, and has a rectangular shape in the plane, with external dimensions of 8,00 x 12,00m, and covering a surface of **Bs = 96,00m^2**; the load-bearing structure consists in structural brick walls, intermediate reinforced concrete roof, and the roof is also a reinforced concrete plaque, “platform” with double sloping, having two lateral brick parapets; the infrastructure consists in concrete continuous foundations under the walls;

rescue station (position nr.24 in the situation plan PS01) is also an older building with a G+ 1F height, and a total height of approx. 7,80m; it has a rectangular shape in the plane, with external dimensions of 8,25 x

10,50m, and covering an area of **Bs = 86,625m^2**; the load-bearing structure consists in structural brick walls, intermediary reinforced concrete roof, and the roof is made of an wooden structure with two slopes, equipped wit lateral brick walls; the infrastructure consists in continuous concrete foundations under the walls;

circular reservoirs (position nr.25 in the situation plan PS01) they are two identical buildings probably for storing the industrial water, necessary for different purposes within the premises; they are two supra-terrestrial circular buildings, covered, made of reinforced concrete; they have an external diameter of around 3,50m, and a storage capacity of around 150m^3 each; their infrastructure consist in a circular concrete raft;

locomotive shed (position nr.26 in the situation plan PS01) is aground floor building, in the plane having an irregular polygonal shape and a maximal height of around 3,00m; it has the external dimensions of 8,00 x 23,50 + 3,25x8,75 + 3,5x6,5 - m, covering a built area of **Bs = 239,20m^2**; its load-bearing structure consists in structural masonry walls, concrete blocks, wooden ceiling and a roof made of a double sloping wooden structure with a metal plate; the infrastructure consists in continuous concrete foundation under the walls;

the compressor house (position nr.27 in the situation plan PS01) is also an older building, with a Ground floor height and a total height of around 3,80m; it has a relatively rectangular shape in the plane, and the external dimensions of 00 x 39,00m; it covers an area of **Bs = 368,00m^2**; its load-bearing structure consists in structural brick walls, reinforced concrete roof; the infrastructure consists in continuous concrete foundations under the walls;

the substation and the annexes (position nr.28 in the situation plan PS01) is also an older building, with a G + 1F height and a total height of around 7,80 m; it has a rectangular shape in the plane and the external dimensions of 7,50 x 38,00m, covering an area of **Sc = 285,00 m^2**; its load-bearing structure consists in frames made of prefabricated elements of reinforced concrete (pillars and beams) with closing brick walls, reinforced concrete ceilings; the infrastructure consists in isolated foundations type “glass” and continuous concrete foundation under the walls; inside the building there are electric equipments necessary for such a post (cell and electric transformers, etc.) supplying all the consumers both subterranean and from the mine surface.

All buildings are connected to the utilities within the Aninoasa premises, receiving electric power, and thermo energy and water where necessary. There is also a sewage system for the facilities.

Mine works see attached plans for longwall exhibition and heading exhibition

6.2 Utilities

a) Electrical power

The supply of E.M. Aninoasa with electricity from the National Power System is ensured through 2 distinct sources:

- The surface and underground areas of the mining perimeters Aninoasa Nord and Piscu are supplied from the Switching and Transformer Substation 110/20/6 KV, the property of ELECTRICA, which is located at the outskirts of Aninoasa Nord premises;
- Aninoasa Sud area is supplied from ELECTRICA plant 20/6 KV located within the premises of Aninoasa Sud.

For the mining perimeters Aninoasa Nord and Piscu the distribution of electricity to the consumption points is ensured from its own Switching and Transformer Substation 6/0, 4 KV connected to the 110/20/6 KV plant by 4 cable feeders of 6 KV. In order to supply electrical power to the 0.4 KV consumers within the premises, the Switching Substation is provided with 2 power transformers of 1600 KVA and a power panel of 0.4 KV. Another 2 transformer substations of 6/0, 4 KV supplied at 6KV from STS 6KV Aninoasa Nord are located in the new electric shop and in the cabin for safety lamps. The distribution panels of the main consumption points are supplied from these 3 transformer substations: the winding engine house, the electric shop, the cabin for safety lamps etc.

Other secondary consumption points (administrative building, rescue station, engine shed etc) are supplied electricity through local distribution panels connected to the main switchboards of the transformer substations. Electrical power is distributed to the panels through buried or visible cables. The only consumption point within the premises supplied with 6KV electrical power was the compressor station fed by 2 cables located on the 2 g of station Aninoasa Nord 6 KV.

b) Compressed air

The compressed air necessary in the mining activity is ensured through a compressor station provided with 4 L100 Resita compressors driven by 500 KW synchronous motors at 6KV, located in the Aninoasa de Nord premises. The compressor motors are driven by means of a 6 KV switching substation positioned in the building of the compressor station and provided with 6 cells out of which, 2 are connected to the source and 4 are motor protection cells. The compressor station is endowed with 4 compressed air surge tanks and the main air compressed network up to the well and on the well is made of 8'' steel pipe.

c) Water supply

Currently the drinking water for E.M. Aninoasa is supplied by means of water catchment at approximately 2.5 km on Valea Aninoasei, with two catchment intakes located on Valea Mica and Valea Chiciurii provided with a dam and a sand-clearing basin. The entrapped water goes through a filter and chlorine treatment plant and reaches a water tower located within Aninoasa Nord premises, where, through a buried steel pipe network, it is distributed to the surface buildings and to the underground pit mining.

d) The sewer system

Currently Aninoasa Nord is endowed with a functional sewer system which in the Canteen area is directed to the sewer system of Aninoasa town. However, Aninoasa town does not have an appropriate water treatment station.

7 THE PROPOSED MUSEUM

The Inception Report proposed two options:

Option 1- Big Pit

Option 2 – Small Pit

7.1 Option 1 – Big Pit

It retained the following buildings[1]

1. Canteen
2. Baths
3. Lamproom
4. Deployment Centre
5. Administration Block
6. Tunnel for miners from deployment to shaft side
7. Headgear and pit top building
8. Winding engine house
9. Electromechanical Workshop (to be used as a visitor reception area and small exhibition area)
10. Rescue station
11. Explosive store (to be used as an underground exhibition area)
12. Access tunnel to Pescu with small loco shed and repair shop

The surface will have to be redesigned to allow public access and parking.

The Big Pit option would have allowed the public to view the daily life of a miner by taking them on tours through from the canteen, to where they bathed, got their

[1] The whole of any building may not be refurbished but at least parts of the named buildings will remain.

lamps and were deployed to the shaft side. It allows for displays en route and the canteen would be functional for visitors to use.
It will retain the pit top but not in working condition, the shaft being filled. And will allow the public to see the pit top tub circuit.

The tunnel between the curtilages would be repaired and would provide a ride through to the picnic area at Piscu on a diesel mine train. The rescue station would be refurbished as an attraction.

A visitor centre could be developed in the large electro-mechanical workshop between the shaft and the administration block as this building is located conveniently in the centre of the site and of sufficient size to admit and muster a number of visitors whilst paying and entering.

The explosive store could be made into the underground exhibition area if another access point was made.

7.2 Option 2 – Small Pit

It retained the following buildings[2]

1. Facia of Administration Block
2. Headgear and pit top building
3. Winding engine house
4. Electromechanical Workshop (to be used as a visitor reception area and small exhibition area)
5. Rescue station
6. Explosive store (to be used as an underground exhibition area)
7. Access tunnel to Pescu with small loco shed and repair shop

The surface would be redesigned to allow public access and parking.

[2] The whole of any building may not be refurbished but at least parts of the named buildings will remain.

The Small Pit option will allow the public to get the feel of mining and will use iconic buildings such as the headgear and winding engine house to convey the size of the operation.

It will retain the pit top but not in working condition, the shaft being filled.

The tunnel between the curtilages would be repaired and would provide a ride through to a picnic area at Piscu on a diesel mine train.

The rescue station may be kept as an exhibition building.

A visitor centre could be developed in the large electro-mechanical workshop between the shaft and the administration block as this building is located conveniently in the centre of the site and of sufficient size to admit and muster a number of visitors whilst paying and entering. It is feasible that this could be also used for a refreshment area as the canteen is not included in this option.

The explosive store would be made into the underground exhibition area if another access point was made.

7.3 Description of the Option 2 – Small Pit

The decision has been made to follow the small pit design and the following sections outline that development.

This Feasibility Study proposes the establishment of a museum complex developed in six existing locations:

- electromechanical shop
- winding tower and head gear building including pit cages
- winding engine house
- explosive store
- engine shed with the underground tunnel of 800 m to Pescu curtilage
- rescue station

The basic concept starts from creating a cultural complex which, besides its main function as a mining museum, should include an outdoor exhibition for large mining machinery and exhibits, landscaped developments with outcrops to present geomorphologic formations and geologic horizons, an outdoor amphitheatre for cultural shows, roads and parking lots, and parks on the land initially owned by the mine.

All these functions have been designed to value the main theme, creating a museum that will present the initial stages of the mining activity and the development of this activity as the main occupation within the locality and finally its cessation, due to the reduction in reserves and adverse economic factors.

By taking the visitor on a designed route, through carefully restored and iconic buildings and by its organisation the museum will present a history of mining activity in the area and will demonstrate both when and how mining took place.

At the end of the tour, the public will have gained an understanding of how the mineral deposits were exploited, the risks that the miners were facing and the very specific equipment and plant used in the operations around the Jiu Valley.

The buildings that will be restored and will host the museum activities are currently highly deteriorated and will need consolidation work to ensure the stability required by the legislation in force. Additionally some will require conversion so that they are fit for purpose and so that they have the correct appearance, will be restored to their 'as built' condition.

The interior and exterior finishes, as well as the electrical installations, plumbing, heating and air conditioning (locally) will also need to be modified.

The study proposes creating a continuous tour for the visitors and includes building of parking lots as well as two bus parking areas.

The visitors reception will be made in the first building (electromechanical shop) which will be arranged and will include a reception hall with a changing room and separated toilets (a disabled toilet is also in plan).

The museum will have two offices and an information point where printed materials and souvenirs can be distributed.

Exhibitions will be organised in the big hall, including an exhibition presenting a history of mining activity in the area.

The exhibition will include exhibits, panels, charts, objects and geologic formations. An important issue is highlighting the exhibits by means of light.

This building will also include a snack-bar with about 10-12 tables for four, with a cooking space and an open terrace with a view to the landscape development proposed (thematic park).

The tour continues with a covered walkway to the pit top building and headgear where the visitors can get an idea of the lift cage and surface operations before proceeding to the winding engine house where the mighty engine can be viewed.

The plan also includes arrangements for an outdoor exhibition to present oversize machinery exhibits, geomorphologic formations and montages.

From the winding house, the public walk to the old explosives store via a covered walkway.

The old explosive store is to be converted so that the public can walk along seemingly underground roadways to view full size face and development exhibits. The visitors will have the opportunity to see via video and practical exhibits how miners work and the machinery that is part of their everyday life.

The tour continues with a winding path to the loco station, the existing building will be demolished and a purpose built station and loco shed constructed that reflects the original building.

The visitors can see the locos and wagons and can also take a ride through the 800 m tunnel to the picnic area on the other side at the PISCU area, a very picturesque leisure area. It may be able to mount some exhibits in the tunnel for entertainment during the ride.

Returning to the station the visitor can visit the rescue station, which will also be a part of the museum. The future development of the mining area, alternative activities and new professional options for the population in the area can be presented in this location.

The proposal provides for creating a large park including green spaces, a lake, alleys, leisure spaces, organised after demolishing the existing buildings. However some of these spaces may not be retained by the museum and the mentioned features will not be provided.

This space would enhance the museum’s importance and will prove that the consequences of reckless exploitation, with devastating impact on the environment, can be eliminated by taking concrete measures.

The afforestation and landscape development works will contribute to the environmental rehabilitation of the area and the museum will have a cultural impact that will value the mining activity.

Besides the rehabilitation and consolidation works, major changes must be brought to the interior installations, according to the new functions.

The plumbing, electric wiring and heating installations must be completely replaced.

For the interior comfort, the museum will need air conditioning, anti theft devices and fire-alarm devices.

Some major earthworks will be needed on site to ensure that the site is suitable for the public to visit.

The following are the area that will be required:

1. Roads and parking lots	Ac = 3.469 mp
2. Winding tower	Ac = 416 mp
3. Electromechanical shop (museum space)	Ac = 1.751 mp
4. Winding house (museum space)	Ac = 416 mp
5. Shed for the explosives warehouse	Ac = 330 mp
6. Covered stockade (new)	Ac = 215 mp
7. Outdoor exhibition (new)	Ac = 2.115 mp
8. Engine shed (new museum space)	Ac = 303 mp
9. Rescue station (museum space)	Ac = 120 mp

After the reconstruction and consolidation works the buildings must be insulated to prevent heating losses.

For the interior, glazed floor tiles, skid-proof will be used, tiles in the toilets and parquet in the offices and parts of the existing floors will be maintained.

The walls will be repaired with a view to preserving their original appearance.

By their placement, the exhibits will highlight the characteristics of the current environment.
Special attention will be given to lights and to the positioning of the lighting fittings that will contribute to enhancing the exhibits value. This will be in addition to the main lighting system.

The interior carpentry will be wood.

The exterior areas will have alleys, exhibition platforms with sand as well as big stone stairs and ramps for disabled access.

There will be landscape development works in the green spaces, the land will be afforested and new leisure spots will be created.

8 GENERAL DEVELOPMENT OF THE MUSEUM

After preliminary analysis of the mine buildings and their location as well as their suitability for use as a museum, it is planned to develop the Aninoasa Mining Museum by utilising the following buildings.

1. **the electro-mechanic workshop**, composed of **the electric workshop hall** (position nr.16 in the situation plan PS01), **the mechanic workshop hall** (position nr.17) and **the tools hall** (position nr.18) This will be used as a multipurpose building housing the reception area

2. **the winding engine house** (position nr.19 in the situation plan PS01)

3. **the pit top building** (position nr.20 in the situation plan PS01)

4. **the headgear** (position nr.21 in the situation plan PS01)

5. **the rescue station** (position nr. 21 in the situation plan PS01)

6. **the explosive store**

7. **the tunnel** to Piscu

In order to meet the legal requirements for buildings to be used as a museum, they have to be improved both structurally and aesthetically .

Additionally, the building of a locomotive shed is required since the existing one is derelict and would cost too much to be refurbished.

9 TECHNICAL DEVELOPMENT OF THE MUSEUM

9.1 Issues and Solutions

The museum presents a number of issues to be resolved before there canb be a conversion from a working mine site to a museum. The following sections identify those issues and offer solutions to them.

9.2 Electrical Power

The electrical sub- station and the existing distribution network cannot be used at all due to the state and reliability of the equipment, as well as its unsuitability for the task.

The power supply from the electricity network is conditioned by the required voltage, the installed capacity and mainly by the capacity required for the entire Museum and the station configuration of the ELECTRICA station 110/20/6 KV located within the Aninoasa Nord premises.

The surface and underground electricity consumers need electrical power to ensure the lighting of the respective areas and the heating of the buildings on the premises. The majority of these consumers need low-voltage power, that is a supply voltage of 380 V (for the heating stations) and 220 V (for lighting).

The installed capacity of the electricity consumers is composed of the heating station and the light wiring.

9.3 Heating

The Small pit solution of Museum presupposes the complete rebuilding of the loco shed on the same site, occupying the same surface as the old building and the refurbishing of the buildings initially constructed as an electro-mechanic shop, winding engine house, shaft house and rescue station. All these buildings will be refurbished as exhibition halls, the main building being also endowed with other specific facilities. It is necessary to ensure the heating of all these buildings in the cold months. Each building will have its individual heating source as a centralised heating source from where the heat should be distributed to each building presupposes additional costs and maintenance problems.

From all the possible heating sources, electricity is considered to be the most economical as the other sources, such as coal, black oil and wood require much stricter exploitation conditions.

These closed spaces have a total built surface of 2996 m^2 and the volume to be heated is 10.484 m^3. As the construction and architecture elements of the

restored buildings and of the refurbished ones are not presented in detail, the thermal energy necessary to cover these area was calculated at 50kcal/m^3 of volume to be heated, thus resulting a thermal duty of 524.200 kcal for the entire area. If considering a heat conversion factor of 860 kcal/kwh, the necessary installed capacity in the heating stations would be 610 KW.

9.4 Illumination

9.4.1 The interior lighting of the buildings

In the museum buildings, most of the space is occupied by the exhibition area which requires a high general and, if necessary, local lighting capacity of 300-400 lx/m^2 for fluorescent lighting. Under these circumstance, for a specific power of 20 W/m^2 is required for the total area of these buildings, the installed capacity would therefore need to be 60 KW.

9.4.2 The external lighting of the museum premises

The museum is planned to be open from 9.00 to 15.00, during daylight hours and the external lighting of the area where the exhibits are displayed in the open would very rarely necessary. Lighting of the Car park may be necessary during the winter months however the main reason for providing this kind of lighting would be to ensure the protection of the premises during night time. The power required by the external lights is insignificant compared to the power required for other parts of the museum and since the external lights are only used when the museum is closed, its consumption is considered to be included in the other calculations.

9.4.3 The lighting of the underground areas

This category includes the Access tunnel to the Piscu area which is 800m long and the former explosive storage which has been endowed with an 86m gallery as a second means of access.

Piscu access tunnel will be used for the museum visitors who want to go to Piscu premises. The visitors will be transported with mine wagons specially equipped for person transportation and hauled by a Diesel mine locomotive. The maintenance of the locomotive and the wagons used for visitor transportation carried out in a specially designed engine shed.

In the tunnel 4KW – 40 W tube fluorescent illuminators will be used.

The explosive store will be refurbished as an exhibition area and as a result it will have to be well lit, the power of the current lights is 5KW.

The total maximum installed capacity of the Museum will be 700 KW. The required total capacity has taken into account the capacity for all amenities and the variation of power requirements on a seasonal and day to day basis. The calculation has also been used to estimate the annual power consumption and the costs incurred for this utility.

As far as the heating station is concerned, besides the seasonally-based variation of the required power between a minimum value during summer and a maximum value during winter, there is another significant variation of the required power between the active day time when the museum is visited and the inactive period when only a minimum temperature and lighting is ensured.

In the exhibition area of the buildings the lighting is maintained at the maximum level during the period that the museum is open.

The underground lighting is only active when the presence of visitors is detected and it is maintained at the maximum level during all this period. The lighting of these areas on the surface and underground are unlikely to be simultaneous and as a result it will reduce the maximum power required.

Taking this account, the maximum power required for the Museum premises will not exceed 660 KW under the most unfavourable circumstances.

Local power station

The 110/20/6 KW ELECTRICA power station located near Aninoasa Nord premises, which also supplies electricity to E.M. Aninoasa, will supply the power for the Museum. Due to the fact that there will be no mining activity it has enough available power and also 6KV starting cells which may be used as backup.

ELECTRICA power station does not normally supply directly a 380 V voltage as this is used for small electricity uses and is not usually transported for hundreds of meters, as would be required in this.

ELECTRICA will supply the required power at 6 KV voltage and the terminals of the 6KV cell represent the limit of the electrical wiring. The power supply will therefore be suplied by means of a 6 KV cable connector and a 6/0.4 KV transformer located in the Museum.

9.5 Electrical

9.5.1 Power supply

The power will be monitored at the substation meter located at ELECRICA station. The 6 kV will be connected to the 6/0,4 KV transformer substation via a buried cable. The transformer substation will be located in a ground mounted mono-block construction with a metal casing and equipped with a 1000 KVA dry transformer that will match the total maximum power required by the Museum.

As the power for the Museum premises varies within a wide range, the transformer load during summer will be under 10% of its capacity, thus causing big losses and additional electricity costs. Therefore the solution proposed is to have a second low voltage power supply source, by means of a 1 kV cable fed from the internal service panel of the 110/20/6 kV station.

The second low voltage power supply source will be operational for approximately 7 months a year when the heating is off. This will require additional equipment fitted and a separate meter. The cable will be designed for the required power of 100 KW and it will be assembled in parallel with the 6 KV supply cable via the same route. The supply solutions have to be approved by the electricity supplier.

9.5.2 Power distribution

The 0,4 kV main switchboard of the premises, which is fed from the transformer substation positioned near the building, will be located in the main building, and designed for the required load. A second power supply of the main switchboard will effected through a 1 kV cable on a separate switching system.

Cables connect the local distribution panels in each of the Museum buildings to the main switchboard.

For the lighting of Piscu access tunnel, the supply circuit will be connected to the distribution panel in the loco shed as it is functionally linked.

The explosive store and its accesses will be supplied from the distribution panel located at the winding engine house. Connecting cables will be buried between the buildings and only visible inside the buildings. The distribution panels will be equipped with reliable automatic switches, depending on the required voltage and power.

9.5.3 Electrical heating of the buildings

Heating is designed for each building and each has its own control panel. They are connected to the local 380/220 V distribution panel. The rooms are heated by static radiators equipped with thermostats for better heat control.

Hot water will be supplied where and when necessary by an electric heater in each building.

9.5.4 The internal lighting system of the buildings

For brick built buildings, the lighting circuits and the sockets will be made of Fy copper wire of 1.5 and 2.5 mm^2 respectively through a conduit under the plaster. Most of the general lighting will be fluorescent, whilst wall brackets will be used for the lighting of local areas.

For the concrete buildings, the winding engine house and the shaft house, the lighting circuits and the sockets will be made of unscreened copper wire visibly fitted on the walls,

9.5.5 The external lighting system

The external lighting of the premises will be used for the parking, access and circulation areas, e.g. the exhibition areas and it will employ natrium vapor-based devices of 1x 125 W fitted on steel lighting poles positioned in the concrete base. The power supply circuit will be made of a buried screened copper wire. The power supply is controlled from the permanent personnel room.

9.5.6 The underground lighting system

The electricity for Piscu access tunnel and the explosive store is provided from separate supply points. There are certain specifications for the lighting of the underground spaces, including a power network whose neutral has to be isolated from the ground in order to avoid electrocution and which has to have appropriate protection and signalling devices; the lights have also to be equipped with safety devices.

The final voltage is obtained by means of a 380/220 V isolator transformer whose capacity is appropriate for each individual area and whose secondary circuit has a neutral isolated from the ground, so that the supply of the illuminators is ensured in 2 phases. For a long circuit, such as the access tunnel, there has to be a three-phase distribution in order to reduce the power losses.

Each supply point is equipped with a lighting transformer, protection devices for 380v and 220v, a 220v distribution panel and a device that registers the decrease

of the network insulation resistance under a certain value, signals this situation and disconnects the lighting system from the power source until the normal operation conditions are restored.

9.6 Phone and Internet network

Aninoasa Nord mining premises has benefited from a phone line connected to the telephone exchange of Aninoasa town. In order to ensure a line to the permanent office located in the main building, this phone line has to be partially refurbished, and if case be, a new service contract should be concluded with the phone company (Romtelecom, or a similar company) operating in the area. In addition, this phone line will make permanent connection of the Museum to the Internet.

9.7 Diesel Locomotive shed

If a Diesel locomotive is going to be used for hauling the visitor wagons, the locomotive shed has to have maintenance equipment for the locomotive and at least 4 wagons. In order to ensure the supply for the locomotive, a buried fuel (Diesel oil) tank fitted with a pump and an oil tank will be used. Used Diesel oil and any oil leakage will be collected and stored in containers located in a specially equipped area and collected by a specialised collection company.

The locomotive shed will have to have a fire prevention and fire fighting system equipped with the materials equipment for the type of flammable substances used. This is likely to be foam or powder extinguishers.

9.8 Water supply

In order to ensure a water supply for the heating units of the Museum buildings, as well as for the sanitary facilities of the main building and of the locomotive shed it is necessary to build a water distribution network at the premises and to connect it to an external source.

The current water supply is no longer economic as it presupposes high maintenance costs. The proposed solution involves the connection of the water distribution network of the premises to the water supply network of Aninoasa town, which is located at about 100 m from the mining premises, with the water being metered.

In order to have a water reserve for fire fighting purposes it is necessary to maintain the existing operational water tank.

The water distribution network will use 2'' PVC pipes buried in the ground at a depth to prevent freezing.

9.9 Sewage disposal

Sewage disposal from the 2 buildings having sanitary facilities presents difficulties as the old sewage system is connected to the town sewage network that may not be used as the town does not have a water treatment station.

The solution proposed involves having a septic tank located near each building having sanitary facilities, and which may be emptied under contract. The septic tank will consist of a concrete reservoir divided in 3 sections and covered with a reinforced concrete plate with round holes.

9.10 Time for completion

It is anticipated that it will take up to 20 months to develop the mine to a point where the museum can become operational. A more detailed plan is in section x

10 DEVELOPMENT OF EMPLOYMENT AT THE MUSEUM

10.1 Total number of employees

The personnel employed by the museum shall have the following tasks:

1. Reception ,welcoming and registering and selling tickets to visitors within the museum;
2. Presentation of the museum (guides);
3. Maintenance and preservation of the exhibits at the museum;
4. Collecting additional interesting pieces of equipment or mining memorabilia from other coal mines from Romania;
5. Organisation of maintenance of the installations and utilities: electrical, heat, plumbing and toilets etc;
6. Developing information packs for distribution at the museum;
7. Guarding and security services;
8. Cleaning;
9. Provision of food and drink for the visitors;
10. Application for funding sources to develop the museum;
11. Museum accountancy
12. Financial and administrative management of the museum;

For a most effective cost management, it is advisable that a person should carry out several tasks as follows:

- 2 persons shall:
  - i. welcome the visitors within the museum
  - ii. present the museum
  - iii. add to the collections interesting objects from other coal mines from Romania;

- 1 person shall have the following tasks:
  - i. Maintain and preserve the equipments, parts and objects within the museum;
  - ii. Ensure technical assistance and maintain in good condition the installations: electrical, heating, plumbing and toilets;

- 1 person shall:
  - i. Maintain cleanliness

- 1 person shall:
  - i. add to the collections interesting objects from other coal mines from Romania

ii. Develop informational materials
iii. Find sources of financing for the museum activities;

- 1 person shall:
  i. Ensure public food services for the visitors;

- 1 person shall ensure:
  i. Financial and administrative management of the museum

Taking into account the fact that the museum is likely to be financed directly by the Local Council of Aninoasa Town and the financial operations are not numerous (visitors tickets, maintenance and procurement expenses, human resources expenses) it is considered that the accountancy can be carried out by the finance/accountancy department of the Aninoasa City Hall.

Guarding and security services will be carried out by personnel employed by the city hall, as it is located less than 200 m away.

The necessary personnel of the museum will therefore consists of 7 employees.

10.2 New jobs

The staff will be employed with the help of either a specialised recruiting company or the specialised department within Aninoasa City Hall. The recruiting procedure will comply with the staff structure described above and with the specific job descriptions having the necessary competencies and qualifications.

Having recruited the personnel, training courses will be necessary so that the employees can adequately meet the demands of a modern interactive museum.
The museum should close during the winter months due to the projected lack of visitor numbers, high maintenance costs and difficult access to the area. Some employees will therefore have no work during this period. Full salary should be paid only to 3 employees, during this time, who ensure maintenance and preparation for the next “touristic” year as follows:

- 1 person with the following tasks:
  i. Maintain and preserve the equipments, parts and objects within the museum;
  ii. Ensure technical assistance and maintain in good condition the installations: electrical, heating, plumbing and toilets;

- 1 person with the following tasks:
  i. add to the collections interesting objects from other coal mines from Romania
  ii. Develop informational materials
  iii. Find sources of financing for the museum activities;

- 1 person with the following tasks:
  i. Financial and administrative management of the museum

- The other 4 employees
  i. can be transferred to the city hall for other specific activities;
  ii. can have a working regime similar to the one in the education system (long holiday);
  iii. can be employed for limited periods (this procedure involves additional costs for the annual personnel selection);

An important human resources source may be the University of Petrosani, Faculty of Mining.

The students should be encouraged to carry out practical activities within the museum and participate to voluntary works to support the development of the area. The initiative, energy and ambition that are specific to the young generation can be highly valuable to the mining museum. The young people can get actively involved and can offer modern solutions to problems that might occur. Generally, young people know foreign languages, have computer and internet skills and can contribute to the development of the museum.

10.3 Training courses

It is recommended that the guides should be recruited among people who have worked in the mining industry so that the knowledge in the field should be value-adding (especially for pupils, emotional involvement is highly important and it can be achieved by narrating personal stories and events related to the mining activities). The guides must have in depth knowledge of the history of the mining activities in Aninoasa, as well as of the history of the region and Romania's history in general. They must have excellent communication skills in order to attract the visitor in interactive discussions and determine the visitors to further recommend the museum.

It is advisable that the guides should have basic first aid knowledge.

Although not a working mine the museum will be a different environment for the public to encounter therefore there should be warning signs including advice and instructions for tourists to avoid any possible mishaps.

The guides, who also welcome the visitors, must be also be aware of this possibility.

Persons serving food must have basic knowledge of health and safety and food hygiene.

The guides and the custodian must have computer and internet skills in order to be able to update their knowledge within the field and participate to conferences and projects in which the museum can be actively involved. Experience sharing is the ideal solution for personal improvement. Visits to other similar museums in Western Europe are beneficial (the National Coal Mining Museum in England, for example) and the expertise of the employees of such institutions is essential for the training of quality professionals.

Foreign languages are highly important, as many tourists come from countries like Germany and the Czech Republic (German speakers). It is recommended that the guides know English, as the international language, and German, according to the statistics and the Mining Museum in Petrosani experience. It is also feasible that audio tapes of various languages can be played at certain points through out the museum so that it can accommodate many nationalities.
In order to be able to participate in wider cultural development projects within the field (international level), the employees must know English so that they can fill in the application forms and discuss with the project initiators or leaders (this is the custodian's responsibility).

11 COSTS

The following section includes the costs of converting the mine from its current use to that of a mining museum.

11.1 Cost of Architectural Works

In compliance with MLPAT Order 11/N/1994 and Law 184/2001 concerning the organisation and performance of the architect profession

1. Roads and parking lots

Surface = 3,469 mp
Value C + I euro/mp = 100 euro/mp
Value C + I = 3,469 mp x 100 euro/mp **= 34,690 E**

2. Electromechanical shop (museum space) – Architectural works

Depth = 1,751 mp
Group IV, point 2 – Culture (Museum)
Value C + I euro/mp = 696 euro
For modernization, development, renovation
Group VII, 60% of C + I
Value C + I euro/mp = 696 euro/mp x 0.60 = 418 euro/mp
For architectural works
Value C + I euro/mp = 418 euro/mp x 45% = 188 euro/mp

Works not included in the minimum price are added
Extra for high quality finishing work
Value C + I euro/mp = 188 euro/mp x 1.10 = 207 euro/mp
Value C + I = 1,751 mp x 207 euro/mp **= 362,457 euro**

3. Winding tower and head gear building including lifts

Depth = 416 mp
Value C + I euro/mp = 207 euro
Value C + I euro/mp = 416 euro/mp x 207= **86,112 euro**

4. Winding gear house (museum space) – Architectural works

Depth = 416 mp
Value C + I euro/mp = 207 euro
Value C + I = 416 mp x 207 euro **= 86,112 euro**

5. Covered building for explosive store – Constructions and plants (new construction)

Depth = 330 mp

Table 1-2, class 2 – assimilated
Value C + I euro/mp = 220 euro
Value C + I = 330 mp x 220 euro **= 72,600 euro**

6. Covered stockade – Constructions and plants (new construction)

Depth = 215 mp
Table 1-2, class 1 – assimilated = 200 euro/mp
Value C + I = 215 mp x 200 euro/mp **= 43,000 euro**

7. Outdoor exhibition (new platform)

Depth = 2.115 mp
Value C + I = 2.115 mp x 50 euro/mp **= 105,750 euro**

8. Engine shed (new museum space) – Architectural works

Depth = 303 mp
Group IV, point 2 (culture – museum)
Value C + I euro/mp = 696 euro
For architectural works
Value C + I euro/mp = 696 euro x 45% = 313 euro
Value C + I = 303 mp x 313 euro/mp **= 94,839 euro**

9. Rescue station (museum space) – Architectural works

Depth = 120 mp
Value C + I euro/mp = 207 euro/mp
Value C + I = 120 mp x 207 euro/mp **= 24,840 euro**

11.2 Costs of Building Structural Works

The following buildings are to be restored and adapted for the museum. Some will require major refurbishment to bring them back to their original state, and some will need laso to be adapted to allow the public access.

Also In order to reduce the seismic risks to the buildings to the level required by the law, the structure of the building will be reinforced by rebuilding all the damaged areas and introducing new structural elements where required.

11.2.1 Electro-mechanic shop

The internal space of this building will be re-partitioned in order to create several compartments with different functions within the museum (tourist reception, exhibition areas etc).

The built surface is Scd = 389,67 + 774,9 + 2 x (124,5 + 105,15) = 1623,87 m^2.
For the purpose of this evaluation, the values do not include VAT.

1. The value of the expert's analysis including drawing up the ground surveys is estimated at:
   EUR 2.5 /m^2 Scd x 1623,87 m^2 = 4 059,675 ≈ **EUR 4 060**

2. The value of the design work for the reinforcement –resistance solutions:
   EUR 4 /m^2 Scd x 1623,87 m^2 = 6 495,48 ≈ **EUR 6 495**

3. The value of the reinforcement- resistance work (evaluated as 50% of the value of a new structure):
   EUR 200 /m^2 Scd x 1623,87 m^2 x 50% = **EUR 162 387**

11.2.2 Winding Engine House

The built surface is Scd = 416,12 x 2 = 832,24 m^2
For the purpose of this evaluation, the values do not include VAT.

1. The value of the expert's analysis including drawing up the ground surveys is estimated at:
   EUR 2,5 /m^2 Scd x 832,24 m^2 = 2 080,60 ≈ **EUR 2 081**

2. The value of the design work for the reinforcement –resistance solutions:
   EUR 4 /m^2 Scd x 832,24 m^2 = 3 328,96 ≈ **EUR 3 329**

3. The value of the reinforcement- resistance work (evaluated as 50% of the value of a new structure):
   EUR 200 /m^2 Scd x 832,24 m^2 x 50% = **EUR 83 224**

11.2.3 Pit-head Building

The built surface is Scd = 127,50 m^2
For the purpose of this evaluation, the values do not include VAT.

1. The value of the expert's analysis including drawing up the ground surveys is estimated at:
   EUR 2,5 /m^2 Scd x 127,50 m^2 = 318,75 ≈ **EUR 319**

2. The value of the design work for the reinforcement –resistance solutions:
   EUR 4 /m^2 Scd x 127,50 m^2 = **EUR 510**

3. The value of the reinforcement- resistance work (evaluated as 90% of the value of a new structure):
   EUR 200 Euro/m^2 Scd x 127,50 m^2 x 90% = **EUR 22 950**

11.2.4 Head Gear

This construction will also be subjected to multiple reinforcement considering the poor shape of the resistance structure. The work will consist of rebuilding all damaged areas or introducing new structural elements if the technical expert's report requires so.

The built surface is Scd = 272,24 x 3 = 816,72 m^2
For the purpose of this evaluation, the values do not include VAT.

1. The value of the expert's analysis including drawing up the ground surveys is estimated at:
   EUR 2,5 /m^2 Scd x 816,72 m^2 = 2 041,80 ≈ **EUR 2 042**

2. The value of the design work for the reinforcement –resistance solutions:
   EUR 4 /m^2 Scd x 816,72 m^2 = 3 266,88 ≈ **EUR 3 267**

3. The value of the reinforcement- resistance work (evaluated as 50% of the value of a new structure):
   EUR 200 /m^2 Scd x 816,72 m^2 x 70% = 114 340,80 ≈ **EUR 114 341**

11.2.5 Rescue station

The built surface is Scd = 86,625 x 2 = 173,25 m^2
For the purpose of this evaluation, the values do not include VAT.

1. The value of the expert's analysis including drawing up the ground surveys is estimated at:
   EUR 2,5 /m^2 Scd x 173,25 m^2 = 433,125 ≈ **EUR 433**

2. The value of the design work for the reinforcement –resistance solutions:
   EUR 4 /m^2 Scd x 173,25 m^2 = **EUR 693**

3. The value of the reinforcement- resistance work (evaluated as 80% of the value of a new structure):
   EUR 200 /m^2 Scd x 173,25 m^2 x 80% = **EUR 27 720**

11.2.6 Locomotive Shed

This construction will have to be rebuilt as it is in an advanced state of decay. The evaluation took into consideration the same built surface as the current building. The estimate includes only the building of the resistance structures without finishes and other facilities.

The built surface is Scd = 239,20 m^2.
For the purpose of this evaluation, the values do not include VAT.

1. The value of the resistance structure design:
   EUR 4 /m^2 Scd x 239,20 m^2 = 956,80 ≈ **EUR 957**

2. The value of the construction - resistance work:
   EUR 200 /m^2 Scd x 239,20 m^2 = **EUR 47 840**

11.3 Cost of Other Required Facilities

The two other features that will require major expenditure are the Tunnel from the main curtilage through to Piscu and the Explosive store.

The tunnel from the curtilage to Piscu requires major refurbishment to make it safe for public access. It will however provide one of the major attractions for the museum and also provide access to a picnic area that will be created once the Piscu site is cleared. It is intended to repair the tunnel, add additional steel supports and then spray gunnite over the interior surface to ensure protection of the tunnel.

The explosive store is to be converted from its current usage into an exhibition area. Using its two main storerooms, a typical faceline and roadway heading will be created for visitors to see. The explosive store does not, however, have two means of egress that are travelable by the public. The existing ventilation shaft at the back of the store is not suitable for such purposes and another roadway will have to be driven at the surface to access the store. The new access will not only allow visitors to exit the store with ease but will also allow the larger face and heading machinery to be transported to site.

11.3.1 Piscu Tunnel

Rebuilding the tunnel reinforcement structure using arch bricks - L=270 m

No.	Type of services	MU	Quantity	Unit price (RON)	Total value (RON)
1	Removing the damaged arch bricks	m^3	1134	120,0	136.080,0
2	Material digging	m^3	27	150,0	4050,0
3	Temporary timbering including manual labor	m^3	15	1440	21.600,0
4	Walling up arch bricks using cement mortar	m^3	1134	100,0	113.400
5	Wall plastering using cement grout	m^3	75	400,0	30.000,0
6	Material transportation for a 10 km distance	t	630	16,7	10.521,0
	TOTAL COST ESTIMATE 1-1				**315.651,0**

Tunnel reinforcement using metallic structures L = 400 m

The tunnel will be reinforced using SG-23 and wood set lagging for a 400 m length

Unit price: RON 1250,0
TOTAL COST ESTIMATE 1-2: 1250,0 x 400m =RON 500 000

Guniting the tunnel walls L=400 m
S=400m x 7 m^2/m =2800 m^2
Amount of gunite: 2800 m^2 x 0,02 =56 m^3
Gunite value: 28 m^3 x RON 575/ m^3= RON 16.100,0
Manual labor value: 2800 m^2 x RON 25,0 / m^2 = RON 70.000,0
TOTAL COST ESTIMATE 1-3: 16.100 + 70.000 = RON 86100,0
COST ESTIMATE NO. 1-4

Rebuilding the tunnel portal					
No.	**Type of services**	**MU**	**Quantity**	**Unit price (RON)**	**Total value (RON)**
1	Removing the damaged areas	m^3	4,0	100,0	4000,0
2	Timber shuttering	m^3	1,0	400,0	400,0
3	Cement	m^3	4	300,0	2400,0
4	Manual labor	-	-	300,0	1200,0
5	Material transportation for a 10 km distance	t	8,0	16,7	133,6
	TOTAL COST ESTIMATE 1-4				**8133,6**

SUMMARY **(RON)**

COST ESTIMATE NAME	ESTIMATED VALUE C+M	COST ESTIMATE NO.
Rebuilding the tunnel reinforcement structure using arch bricks	315.651,0	Cost estimate no. 1-1
Tunnel reinforcement using metallic structures L=400m	500 000,0	Cost estimate no. 1-2
Guniting the tunnel walls L=400 m	86.100,0	Cost estimate no. 1-3
Rebuilding the tunnel portal	8.133,6	Cost estimate no. 1-4
TOTAL	909.884,6	
VAT 19%	172.878,07	
TOTAL ITEM NO. 1	**1.082.762,67**	

11.3.2 Explosives Store Conversion

Building an access gallery to the explosive storage - L= 88m

Digging total profile and temporary timbering GSZ-4,6 R-1300-1X400
Unit price: RON 1200,0 /m
TOTAL COST ESTIMATE: RON 1200 x 88 m =RON 105.600,0

Portal building

No.	Type of services	MU	Quantity	Unit price (RON)	Total value (RON)
1	Timber shuttering	m^3	1,0	400,0	400,0
2	Cement	m^3	4	300,0	2400,0
3	Manual labor	-	-	300,0	1200,0
4	Material transportation for a 10 km distance	t	8,0	16,7	133,6
	TOTAL COST ESTIMATE 2-2				**4133,6**

11.3.3 Underground lighting

Cable, illuminators and other necessary equipment: RON 13600,0
Manual labor: RON 6000,0
TOTAL COST ESTIMATE 2-3: RON 19.600,0

11.4 Construction Of An Access Gallery To The Explosive Store

11.4.1 Financial Summary

Cost estimate name	Estimated value C+m	Cost estimate no.
Building an access gallery to the explosive storage	105.600,0	Cost estimate no. 2-1
Portal building	4133,6	Cost estimate no. 2-2
Underground lighting	19.600,0	Cost estimate no. 2-3
TOTAL	243.867,2	
VAT 19%	46.334,8	
GRAND TOTAL GENERAL ITEM NO. 2	**290.202,0**	

11.4.2 Underground lighting

Cable, illuminators and other necessary equipment: RON 25.000,0
Manual labor: RON 6000,0
TOTAL COST ESTIMATE 3-1: RON 31.000,0

Culvert building (amenajare) L= 800 m
TOTAL COST ESTIMATE 3-2: RON 80.000,0

C.F. and personnel circulation space building
TOTAL COST ESTIMATE 3-3: RON 200.000,0

Equipment
Mine locomotive LDM :45.000,0
Push-cart 6 pcs x RON 3500,0 / pcs = RON 21.000,0
TOTAL COST ESTIMATE 3-4: RON 66.000,0

11.5 Refurbishing The Aninoasa- Piscu Tunnel

11.5.1 Financial Summary

Cost estimate name	Estimated value C+m	Cost estimate no.
Underground lighting	31.000	Cost estimate no. 3-1
Amenajare rigola Culvert building	80.000,0	Cost estimate no. 3-2
Amenajare C.F. si spatiu circulatie personal C.F. and personnel circulation space building	200.000,0	Cost estimate no. 3-3
Facilities	66.000,0	Cost estimate no. 3-4
TOTAL	377.000,0	
VAT 19%	71.630,0	
GRAND TOTAL GENERAL ITEM NO. 2	448.630,0	

COST ESTIMATE ITEM. 4
Building of ventilation raise circulation space L=40m
TOTAL COST ESTIMATE: RON 40.000,0

11.6 Electricity

11.6.1 Cost of the Electricity supply system

No.	Name	MU	Quantity	Unit price (RON)	Total value (RON)
1	6 kV connection in buried ACYSEABY 3x70 mm^2 cable	m	190	95	18.050
2	1 kV connection in buried ACYAbY 3x185+95 mm^2 cable	m	240	84	20.160
3	Additional work at Electrica station				15.000
4	Block for measuring the consumed power and electricity at 6 and 0.4 kV	pcs	2	4.000	8.000
5	6/0.4 kV transformer substation in metallic casing with dry transformer	pcs	1	220.000	220.000
6	Design expenses, electricity taxes				38.000
	TOTAL COST ESTIMATE 1				**319.210**

11.6.2 Cost of Electrical distribution on the premises

No.	Name	MU	Quantity	Unit price (RON)	Total value (RON)
1	0.4 KV main switchboard main building, Pi= 700 KW	pcs	1	19.000	19.000
2	Local distribution panel at the winding engine house, Pi= 300 KW	pcs	1	9.500	9.500
3	Local distribution panels at the engine shed, well house and rescue station, Pi= 60 KW	pcs	3	4.800	14.400
4	Connections in 1 KV ACYAbY cables buried between the main switchboard and the local distribution panels	m	310	72	22.320
5	Checking and additional work at the grounding installation	pcs	5	2.500	12.500
	TOTAL COST ESTIMATE 2				**77.720**

11.6.3 Cost of Internal electrical system for surface buildings

No.	Name	MU	Quantity	Unit price (RON)	Total value (RON)
1	Internal electrical system with fluorescent illuminators	m^2	2.996	98.5	295.106
	TOTAL COST ESTIMATE 3				**295.106**

11.6.4 Cost of External electrical system on the premises

No.	Name	MU	Quantity	Unit price (RON)	Total value (RON)
1	External electrical system with natrium vapor-based devices fitted on steel lighting poles positioned in the concrete base and supplied through a buried cable	km	0,35	166.000	58.100
	TOTAL COST ESTIMATE 4				**58.100**

11.7 Cost of Museum heating system

No.	Name	MU	Quantity	Unit price (RON)	Total value (RON)
1	48 KW modulated heating power stations	pcs	14	7.000	98.000
2	Heating systems	m^2	2.996	90	269.640
	TOTAL COST ESTIMATE 5				**367.640**

11.8 Cost of Septic tank

No.	Name	MU	Quantity	Unit price (RON)	Total value (RON)
1	Septic tank	pcs	2	19.000	38.000
	TOTAL COST ESTIMATE 6				**38.000**

11.9 Cost of Drinking water network on the premises

No	Name	MU	Quantity	Unit price (RON)	Total value (RON)
1	Pipe fitting to the town water network and PVC 2" pipe water distribution network on the premises	km	0,4	54.000	21.600
	TOTAL COST ESTIMATE 7				**21.600**

11.10 Cost of Rehabilitation of the telephone connections

No.	Name	MU	Quantity	Unit price (RON)	Total value (RON)
1	Telephone connection to the Aninoasa network and residence station inside the main building	km	0,5	48.000	24.000
	TOTAL COST ESTIMATE 8				**24.000**

11.11 Utility Estimate Costs

No.	Name	MU	Quantity	Unit price (RON)	Total value (RON)
1	ELECTRICITY, out of which: - external lighting on the premises 125W x 8 h/day x 365 days/year = 4.015 kwh - internal lighting 60 kw x 2 h/day x 312 days/year = 37.440kwh - Tunnel and explosive storage lighting 9 kw x 2 h/day x312 days/year = 5.616 kwh - electrical heating 610 kw x 12 h/day x 150 days/year = 1.098.000 kwh	kwh	1.145.071	0,4	458.028
2	DRINKING WATER	m^3	468	1,9	889
3	DIESEL OIL	t	3	3.500	10.500
4	PHONE BILL	month	12	50	600
	TOTAL				**470.017**

11.12 Overall Estimate of the Cost of Utilities

It has been estimated that the planned museum and associated will consume the following:

- Running water: 700 m^3/month;
- sewerage:
- electric power: 7.000 kw. / month;
- wood for fire: 7 m^3 / month;
- sanitation (waste):
- telephone: 400 RON/month
- TV cable: 40 RON/month
- Internet: 300 RON/month

Possible suppliers of the utilities and their prices are as follows:

Utility suppliers and their price per unit:

Nr.	Utility	Supplier	m. U.	Price/unit [RON/m.u.]
1.	Current water		m^3	0,95
2.	Sewerage			
3.	Electric power	Electrica SA	kw	0,36
4.	Wood for fire/gas		m^3	150
5.	Sanitation		m^3	20
6.	Telephone	Romtelecom		400
7.	TV Cable		Subscription	40
8.	Internet		Subscription	300

Assuming that the museum will be open to the public for only 9 months/year, the annual consumption will be :

Nr.	Specification	Partial months	Complete months
1.	Electric power	3	9
2.	Woods for fire	3	9
3.	Drinking water	3	9
4.	Sanitation	3	9

Estimated Annual Expenditure:

Nr.	Specification	MU	Specific medium consume/ complete month	Price/ unit	Value of the consume /complete month	Value of the annual consume
1.	Electric power	kw	7.000	0,36	2.520	30.240
2.	Wood for fire/gas	m^3	7	150	1.050	12.600
3.	Drinking water	m^3	700	0,95	665	7.980
4.	Sewerage				500	6.000
5.	Sanitation				300	2.880
6.	Telephone				400	4.800
7.	Internet				300	3.600
8.	TV Cable				40	480
9.	Total				7.235	86.820

11.13 Summary

The following indicate the summary of costs included in this feasibility study of the additional expenditure to develop the museum. These may very well be paid for independently of the museum but have to be taken into account

- **Obtain approvals, agreements and permits.** Include expenses for:
  - Obtaining planning permit (certificat de urbanism);
  - Obtaining construction permit;
  - Obtaining agreements and permits for connection to public utilities networks: water, sewerage, gas, heating, electrical power, telephone.
  - Obtaining environmental agreement;
  - Obtaining fire brigade agreement.
  - These expenses represent 1.1% of the main capital expenditure.
  - 1.1% x 2,144,867 = **23,594 EUR**

- **Design.** Includes costs of all design phases: this feasibility study, technical blueprint, execution details.
  - Feasibility study: 40,000 EUR
  - Technical blueprint: 30,000 EUR
  - Execution details: 10,000 EUR
  - **TOTAL: 80,000 EUR**

11.14 Main capital expenditure

- **Construction and installation.** Includes cost of all items in the project:
  - Museum buildings;
  - Museum utilities:
    - Electrical installation;
    - Plumbing;
    - Indoor gas installation;
    - Heating installation;
    - Air conditioning installation;
    - Telephone.

As per the priced bills of quantities, the cost of refurbishment and conversion work amounts to **2,144,867 EUR**.

11.15 Other expenses

- **Financing costs.** Includes cost of obtaining financing. According to Chapter “Financing Sources”, 100% of the capital expenditure is financed from the

Fund for Closure and Conservation of Aninoasa Mine. We are not aware of any details on the funds allocated to this project.

- **Miscellaneous and incidental expenses.** These were estimated as percentage of the cumulated costs up to point 2.4.1.4, taking into account the complexity of works.

  Represent 5% of (Main capital expenditure + Design and approvals expenses):
  5% x (2,144,867 + 47,000) = **109,593 EUR**

11.16 Commissioning expenses

- **Personnel training & hiring.** Includes cost of training personnel to provide quality services and to use correctly the plant and equipment in the museum.
  7 persons x 71 EUR = **497 EUR**

11.17 Working capital required for starting activity

Includes expenditure required for the first 3 months of operation to cover the following:

- Staff wages;
- Materials and consumables;
- Utilities;
- Transportation.

Estimated amount: 48,464 EUR.

11.18 Overall Capital Expenditure.

OVERALL COST ESTIMATE			
CAPITAL EXPENDITURE REQUIRED FOR COMPLETING THE PROJECT: "ANINOASA MUSEUM"			
PRICES AT: 15 June 2006			
EXCHANGE RATE (RON/EURO): 3,5246			
No.	Name of Chapters	Total amount (excl. of VAT)	
		Total	
		EUR	RON
1	2	3	4
	PART I		
	Cost of Land Acquisition and development		
	TOTAL		
1.1	Obtain land	0	0
1.2	Develop land (roads and car park areas)	34,690	122,268
1.3	Environmental protection work	0	0
	TOTAL	**34,690**	**122,268**
	Cost of supplying utilities	0	0
	TOTAL	0	0
	Cost of design and technical assistance		
3.1	Field surveys	0	0
3.2	Obtain approvals, agreements and permits (1 +	23,594	83,158
3.3	Drawings and engineering	47,000	165,656
3.4	Organise public tender procedures	0	0
3.5	Consulting services	0	0
3.6	Technical assistance	0	0
	TOTAL	**70,594**	**248,814**
	Main capital expenditure		
4.1	Constructions and associated installations	2,144,867	7,559,798
4.2	Erecting plant and associated installations	0	0
4.3	Plant and equipment including fitting	0	0
4.4	Plant no fitting and transportation equipment	0	0
4.5	Equipment	0	0
	TOTAL	**2,144,867**	**7,559,798**
	Other costs		
5.1	Site organisation	53,622	188,995
	5.1.1 Construction work	26,811	94,497
	5.1.2 Expenses associated to site organisation	26,811	94,497
5.2	Commissions, taxes, legal fees, financing costs	10,724	37,799
	5.2.1 Legal charges, taxes and fees	10,724	37,799
	5.2.2 Cost of loan (interest)	0	0
5.3	Miscellaneous and incidental expenses	109,593	386,273
	TOTAL	**173,939**	**613,067**
	Initial expenses during Start Up		
6.1	Train operating personnel	497	1.750
6.2	Commissioning tests	0	0
	TOTAL	**497**	**1.750**

OVERALL COST ESTIMATE			
CAPITAL EXPENDITURE REQUIRED FOR COMPLETING THE PROJECT: "ANINOASA MUSEUM"			
PRICES AT: 15 June 2006			
EXCHANGE RATE (RON/EURO): 3,5246			
No.	Name of Chapters	Total amount (excl. of VAT)	
		Total	
		EUR	RON
1	2	3	4
TOTAL PART I		**2,424,586**	**8,545,697**
Of which, C + M		2,144,867	7,559,798
VAT PART I (19%)		460,671	1,623,682
TOTAL PART I INCLUSIVE OF VAT		**2,885,258**	**10,169,379**
Of which, C + M		2,552,392	8,996,160
PART A II-A			
Discounted residual value of existing fixed assets included in the project (immaterial values)		0	0
PART A III-A			
Working capita; for the first production cycle		48,464	170,816
VAT PART III (19%)		9,208	2.613
TOTAL PART III INCLUSIVE OF VAT		**57,672**	**173.428**
TOTAL GENERAL, exclusive of VAT		**2,473,050**	**8,716,512**
Of which, C + M		**2,144,867**	**7,559,798**
Of which,			
TOTAL TO FINANCE (PART I+III)		**2,473,050**	**8,716,512**
INCLUSIVE OF VAT :		**2,942,930**	**10,342,807**

12 WORK SCHEDULE

Activities	Schedule (months)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
• Obtain planning permit																				
• Obtain approvals and agreements for connections to public utilities networks :water, sewerage, gas, heating, electricity, telephone																				
• Obtain environmental agreement																				
• Obtain building permit																				
• Obtain fire brigade approval																				
• Other approvals required for museum operation																				
• Development of museum																				
• Reception on completion of works																				
• Correction of work identified in the reception report																				
• Final reception																				
• Personnel recruitment																				
Commissioning (PIF)																				
• Advertising and publicity																				

13 INCOME AND EXPENDITURE FOR THE ANINOASA MINES

13.1 Estimated Income from the Museum

Operation income related for this project has been established based on the prices of the access tickets, leaflets and souvenirs and taking into account the likely amount that the museum is visited during the high, low and intermediate season.

The low season means, for the purpose of this project, the winter months: December, January, February, when the museum is closed for the visitors and no revenues can be obtained from the selling of tickets.

The intermediary season covers the spring and autumn months when the main visitors are the groups of schoolchildren.

The high season covers the summer months in which the main visitors are the foreign tourists, very fond of the souvenirs and objects representative of the parts of the country they visit.

For this purpose, we suggest that the prices should be discounted depending on the type of visitors, i.e. schoolchildren and students should benefit from a discount of 70% from the price of the tickets, particularly aiming at raising their awareness of the past and present mining situation in Romania.

The curator and the manager of the museum will have an essential role in obtaining additional sources of funding.

The sources of funding can cover 4 categories:

- Revenues obtained from the sale of tickets
- Revenues obtained from the sale of souvenirs, food products at the snack-bar
- Subsidies from the local budget (Local Council of Aninoasa)
- Funding and sponsoring from commercial companies and natural persons
- Funding obtained by developing projects and by participating in cultural development projects

13.1.1 Capacity of the museum

The statistics provided by the Mining Museum from Petrosani show that this is visited by approximately 8,000 visitors a year. 70% of them visit the museum during the high season and they are mainly foreign tourists. The capacity of the

mining museum is potentially far greater than that but these higher figures have not been used.

It is possible that during opening a coach of approximately 40 people could be catered for each hour. Assuming that the museum is open 8hrs per day for 6 days per week for 9 months a year, this gives a potential of 40 x 8 x 6 x 39 that is approximately 75,000 visitors. This is a conservative estimate.

However this number seems irrelevant by comparison to the number of visitors predicted.

13.1.2 Revenues obtained from the sale of access tickets

One of the main source of revenue will be from selling entrance tickets.

For the purpose of estimating the revenues from selling tickets, three different periods were considered, each characterised by a different occupancy degree.

The statistics provided by the Mining Museum from Petrosani show that this is visited by approximately 8,000 visitors a year. 70% of them visit the museum during the high season and they are mainly foreign tourists.

To this end, a tariff accepted by the foreign tourists is approximately 5 Euros a person (15 RON), a tariff acceptable even for the Romanian tourists on holiday in these parts.
For schoolchildren and students the suggested tariff is 30% of the basic tariff, that is 5 RON, large groups of schoolchildren benefiting from discounts up to 3 RON per person.

Calculation of revenues for an average number of tourists is shown below:

	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Total**
No. of visitors	0	0	600	700	800	1100	700	800	300	600	700	0	**6300**
Adults	0	0	100	100	200	500	600	700	200	100	100	0	***2600***
Schoolchildren and students	0	0	500	600	600	600	100	100	100	500	600	0	***3700***

The annual number of visitors for the next 10 years is shown in the following table: The number of visitors is estimated to increase as the museum becomes more and more renowned and based on an appropriate marketing.

RON

	1st year	**2nd year**	**3rd year**	**4th year**	**5th year**	**6th year**
No. of visitors	6,300	7,430	9,138	10,786	12,198	13,418
Adults	*2,600*	*2,990*	*3,588*	*4,126*	*4,539*	*4,993*
Schoolchildren and students	*3,700*	*4,440*	*5,550*	*6,660*	*7,659*	*8,425*
Increase of the number of adult visitors		15%	20%	15%	10%	10%
Increase of the number of schoolchildren visiting the museum		20%	25%	20%	15%	10%

	7th year	8th year	9th year	10th year	**Total**
No, of visitors	14,510	14,973	15,460	15,460	**119,672**
Adults	*5,242*	*5,242*	*5,242*	*5,242*	***43,805***
Schoolchildren and students	*9,267*	*9,731*	*10,217*	*10,217*	***75,867***
Increase of the number of adult visitors	5%	0%	0%	0%	
Increase of the number of schoolchildren visiting the museum	10%	5%	5%	0%	

The revenues obtained from the sale of the access tickets are established in the following way:

Ticket for an adult person: 15 RON

Ticket for a schoolchild: 5 RON

RON

	1st year	**2nd year**	**3rd year**	**4th year**	**5th year**	**6th year**
Total revenues obtained from selling tickets	57,500	67,050	81,570	95,193	106,377	117,015
Adults	*39,000*	*44,850*	*53,820*	*61,893*	*68,082*	*74,891*
Schoolchildren and students	*18,500*	*22,200*	*27,750*	*33,300*	*38,295*	*42,125*

	7th year	8th year	9th year	10th year	**Total**
Total revenues obtained from selling tickets	124,972	127,289	129,722	129,722	**1,036,409**
Adults	*78,635*	*78,635*	*78,635*	*78,635*	***657,076***
Schoolchildren and students	*46,337*	*48,654*	*51,086*	*51,086*	***379,333***

Revenues obtained from the sale of leaflets, souvenirs and from the provision of public food services

The analysis of the activity of other museums existing on the market shows that these revenues cover an important percentage of the museums' turnover.

In this case we will assume the following expenses incurred by visitors:

RON	**Souvenirs**	**Public food services**	**Total**
Adults	10	5	15
Schoolchildren	5	5	10

According to these expenses, the revenues estimated for the first 10 years of the museum's activity are as follows:
RON

	1st year	**2nd year**	**3rd year**	**4th year**	**5th year**	**6th year**
Total of other revenues obtained from visitors	76,000	89,250	109,320	128,493	144,672	159,140
Adults	*39,000*	*44,850*	*53,820*	*61,893*	*68,082*	*74,891*
Schoolchildren and students	*37,000*	*44,400*	*55,500*	*66,600*	*76,590*	*84,249*

	7th year	8th year	9th year	10th year	**Total**
Total of other revenues obtained from visitors	171,309	175,943	180,808	180,808	**1,415,743**
Adults	*78,635*	*78,635*	*78,635*	*78,635*	***657,076***
Schoolchildren and students	*92,674*	*97,308*	*102,173*	*102,173*	***758,666***

It results that the total amount of the revenues obtained from visitors is as follows:

RON

	1st year	2nd year	3rd year	4th year	5th year	6th year
Total of revenues obtained from visitors	133,500	156,300	190,890	223,686	251,050	276,155
Adults	*78,000*	*89,700*	*107,640*	*123,786*	*136,165*	*149,781*
Schoolchildren and students	*55,500*	*66,600*	*83,250*	*99,900*	*114,885*	*126,374*

	7th year	8th year	9th year	10th year	**Total**
Total of revenues obtained from visitors	296,281	303,232	310,530	310,530	**2,452,152**
Adults	*157,270*	*157,270*	*157,270*	*157,270*	***1,314,152***
Schoolchildren and students	*139,011*	*145,961*	*153,259*	*153,259*	***1,138,000***

14 FUNDING FOR THE MUSEUM

14.1 Sources within Romania

14.1.1 Local Support

The Mayor of Aninoasa town showed a great deal of interest in the development of this project. He wanted to develop the area either as a museum or an industrial park whichever was going to be most economic and viable. He offered the unrestricted help of the local community in supporting the development of a plan for a mining museum at Aninoasa.

This included financial support for the running costs of Aninoasa mining museum project from the local budget as he considered that there would be benefits for the community.

However the Mayor has not been able to provide an estimate of the amount of funding that could be expected from the local budget.

Following discussions, the Mayor promised to provide all the information and documents necessary to prepare the rationale for financing the project from the local budget. This included:

- Decisions of the Local Council regarding the financing of the project of Aninoasa Mining Museum;
- Information about other projects of the Aninoasa Local Council
- The local budget of Aninoasa town hall for the previous years as well as the 2006 forecast;

However subsequently the Mayor has not been able to provide the promised information due to other priorities of the Local Council including the local issues of Bird Flu.

Consequently, we recommend that the local budget subsidies be discussed further to determine the possible level of support, as this is the most likely source of income for the museum.

14.1.2 Support of Commercial companies and Entrepreneurs

According to the Fiscal Code, tax payers may allocate 2% of their income tax contributions to sponsor non-profit making organisations set up in accordance with the Ordinance no. 26/2000 regarding associations and foundations.

This mechanism has a series of advantages for all parties concerned - tax payers, organisations and state:

- it is a democratic mechanism which contributes to the transparency of the fiscal and budgetary policy
- it assists the non-governmental organisations in their efforts to solve various social problems
- it allows citizens to contribute to the efforts of solving various social problems without, however, generating an additional cost
- it relieves the state budget because the services provided by non-governmental organisations are usually of a good quality and cost-effective. Non-governmental organisations mobilise financial resources from various different sources and many of them involve the work of volunteers
- it creates a connection between state, tax payers and organisations thus contributing to the development of civil society and social capital

A mechanism is created by which a citizen can decide the way in which the 2% of the income tax is spent, directing this sum to the non-governmental organisation. A form of partnership between tax payers, revenue authorities and the NGO sector is therefore created.

In practice, the tax payer tells the State how his or her income tax should be spent.

However care needs to be taken as this sum is not a sponsorship or donation, but, part of the state budget which is directed by each citizen towards the non-governmental sector. The law is viewed by many as indirect support provided by the state for the non-profit sector or as a model of “transition philanthropy” given that it is only used in Eastern European countries.

The 2% provision can however provide a significant contribute to the financial viability of an organisation and it is a legitimate method of raising funds.

In addition:

- it may be an opportunity to promote the organisation
- it may contribute to the establishing of a closer relationship with the community
- it may support the organisation in other fund-raising methods
- it may support the organisation in the campaigns to attract volunteers
- it may contribute to the increase of the organisation’s credibility

In order to raise funds through this method it is recommended that should Aninoasa Mining Museum proceed it should go through the following stages

Stage 1. Plan

- Who do they want to collect the 2% from?

Stage 2. Prepare

- Is there a person in charge of the 2%?
- Does he/she have materials available for those who request additional information?
- Is there a person who can efficiently and pertinently answer to these questions?
- Is there an annual report for the previous year?

Stage 3. Implement

- Are you known by those from whom you want to collect the 2%?
- Do you know what are the most efficient channels to reach the target group
- What would be the most efficient messages for the target group?
- What funds do you have to carry out a campaign for the 2%?
- What volunteers do you have to carry out a campaign for the 2%?
- Who can support you in a campaign for the 2%- mass media, economic operators in public places, opinion leaders, etc?

Stage 4. Requesting the 2%

- Have you requested the 2% firstly from those around you: members of the organisation, employees, members of the management board, friends, colleagues, previous sponsors and donors etc
- Did you carry out the campaign the way you planned it during the previous stage?

Stage 5. Assessment

- How much money did you collect through this method?
- Was the campaign financially efficient?
- How did everything go during the campaign?
- Do you think you have a better image in the community?
- How will you inform the public about the results of the campaign?
- How will you inform the public about the actions carried out with the funds collected?
- What could you do better?
- What could you change?

14.1.3 National Sources

One potential funding source would be to apply for a grant awarded by the "Administration of the National Cultural Fund".

This programme covers activities and projects of maximum 40,000 RON.

In order to access the funds, the person in charge of the project (the curator) should have an Internet connection, and be a dynamic person, with initiative. It is quite feasible that volunteers from Petrosani University, Mine Faculty could contribute to this with ideas and assistance with projects.

The frequency that applications may be made is probably about every three years for a project, given that the funds are awarded based on a tendering procedure. However submitting a project does not necessarily guarantee success in obtaining funding.

14.2 International Sources

Other opportunities are available by participation in larger international cultural projects. One project, currently underway, is the COST European Research Programme, Action 27, "Understanding the pre- industrial structures from the rural and mining areas – Landmarks" 2004-2008.

These extensive grant schemes can be accessed particularly through the specialised web pages www.cultura.ro and www.cimec.ro.

The participation in these international projects depends 100% on the ability of the general manager and of the curator to get actively involve in debates, conferences as well as in searching for these opportunities on the internet.

Because they are 'ad hoc', such events have not been taken into consideration in the analysis of the revenues of the Mining Museum.

15 FINANCE

15.1 Main technical and economic indicators of investment

See Annexes 1-5

The economic indicators do not show a viable proposition.

15.2 Estimated Operational Costs

Operational costs include expenses incurred by the following types of activities:

- The remuneration of the personnel;
- Utilities
- Advertizing
- Current reparations and cleaning;
- Telephone calls;
- Business trips and visits;
- Transport expenses.

15.2.1 Remuneration

The following staffing is required to run the museum efficiently:

- director: 1;
- curator: 1;
- technician: 1;
- guide: 1;
- snack-bar seller: 1;
- cleaning responsible: 3;

It is anticipated that after two years two more technicians would be required because of the increasing number of exhibits and their technical variety as well as a curator in order to participate in larger projects (implicitly to obtain larger funds).

There is also an anticipated increase in salaries equal to 5% per year, in order to cover the inflation.

RON

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Remuneration expenses	108.168	113.576	155.311	163.077	171.231	179.792
of which for the new employed			*36.056*			
Increase	0	5%	5%	5%	5%	5%

	Year 7	Year 8	Year 9	Year 10	Total
Remuneration expenses	188.782	198.221	208.132	218.538	1.704.828
of which for the new employed	*176.011*	*190.361*	*208.759*	*219.859*	*831.047*
Increase	5%	5%	5%	5%	

15.2.2 Initial and Continuous training of the personnel

Specific training will be required for the staff as many will not have had the necessary experience.

In order to reach the requisite standards of a modern museum, a sum of 500 Euro per annum has been allocated for the training of the personnel. In the third year, these expenses will increase by 20% to account for the projected increase in staff:

RON

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Training expenses	1.750	1.750	2.100	2.100	2.100	2.100
Increase		0%	20%	0%	0%	0%

	Year 7	Year 8	Year 9	Year 10	Total
Training expenses	2.100	2.100	2.100	2.100	20.300
Increase	0%	0%	0%	0%	

15.2.3 Travel expenses for conferences, congresses, other similar museums

It is necessary to maintain contact with colleagues within the same field, namely the Romanian National Committee, ICOM, that is part of the International Council of the Museums. All new developments in the field are presented to such conferences and congresses.

Also, visits to similar museums in Western Europe will help the manager and the curator to recognise the specific dangers and opportunities within the field and also to find solutions to problems and to understand different museums' successful formulas.

The expenses anticpated for such activities should be calculated according to the number of days of each trip (for the daily fee) and the transportation and accommodation expenses:

No of days for the trip: 20 days
Accommodation expenses: 40 Euro/day
Daily fee: 10 Euro/day
Transport: 5 trips of 100 Euro/trip
A 20% increase of these expenses is expected in the in the third year:

RON

	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Expenses for conferences, trips	5.250	5.250	6.300	6.300	6.300	6.300
Increase		0%	20%	0%	0%	0%

	Year 7	Year 8	Year 9	Year 10	Total
Expenses for conferences, trips	6.300	6.300	6.300	6.300	60.900
Increase	0%	0%	0%	0%	

15.2.4 Restoration and maintenance

Because of the technical nature of the museum, the exhibits will need to be continuously maintained. All exhibited items will have been used in mining operations and/or be of historical significance. It is assumed that they will be , for the most part, in a state of disrepair and will therefore require significant funds to repair, maintain and preserve them.

Also, the maintenance of the utilities at the museum itself (e.g heating system, air conditioning, sanitary and electric installations), furnishings, and other equipment (computers, snack-bar equipments) will require annual funding.

Therefore, we have assumed an annual expense of 10% of the value of the museum equipments for their service and maintenance. This is a typical figure elsewhere.

The value of museum equipments	14.500 Euro
The weight of the annual service	10%
Service expenses	1.450 Euro

Thus, there will be an annual maintenance expense of 5.075 RON/year with an annual increase of 5% due to the ageing of the equipment and the need to eventually replace items:

RON

	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Repairs expenses	5.075	5.329	5.595	5.875	6.169	6.477
Increase	0	5%	5%	5%	5%	5%

	Year 7	Year 8	Year 9	Year 10	Total
Repairs expenses	6.801	7.141	7.498	7.873	63.833
Increase	5%	5%	5%	5%	

We anticipate that the specific maintenance costs for the exhibits will be around 2.000 Euro/year with a 5% increase per year.

RON

	Year 1	Year2	Year 3	Year 4	Year 5	Year 6
Expenses for exhibits maintenance	7.000	7.350	7.718	8.103	8.509	8.934
Increase		5%	5%	5%	5%	5%

	Year 7	Year 8	Year 9	Year 10	Total
Expenses for exhibits maintenance	9.381	9.850	10.342	10.859	88.045
Increase	5%	5%	5%	5%	

15.2.5 Estimate of necessary raw materials, materials, fuel and energy and their prices;

Because of the very specific activities of a mining museum and the large variety of raw materials and consumables necessary to effectively run the museum, it is considered relevant to make a global estimate of all materails used.

The following materials are therefore needed:

- consumables for the snack-bar:
  - table clothes, table linen, napkins, different accessories, etc;

- raw materials for the snack-bar:
  - all the necessary in order to prepare the dishes in the menu;

- merchandise:
  - soft and alcohol drinks, cigarettes, snacks, etc;

- merchandise:
  - souvenirs, maps, books on mining, etc.

Income from sales has been estimated as comprising 40% for sale of food and drink, and 60% for sale of merchandise. There is a 30% margin for all sold goods.

These expenses change in proportion to the rate of turnover and it has been calculated that they maintain the same weighting in relation to the museums turnover over the period being considered. This is 70% following a commercial margin. The rate of turnover is suuported by “Other income”.

Using this hypothesis, the annual expenses for raw material, consumable materials and merchandise were estimated at the following rates:

RON

	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Total other income visitors	76.000	89.250	109.320	128.493	144.672	159.140
Weight of the expenses	*70%*	*70%*	*70%*	*70%*	*70%*	*70%*
Total expenses for raw materials, merchandise	53.200	62.475	76.524	89.945	101.271	111.398

	Year 7	Year 8	Year 9	Year 10	Total
Total other income visitors	171.309	175.943	180.808	180.808	1.415.743
Weight of the expenses	*70%*	*70%*	*70%*	*70%*	*70%*
Total expenses for raw materials, merchandise	119.916	123.160	126.566	126.566	991.020

15.2.6 Estimate of labour expenses

For the annual labour expenses the average monthly gross salaries to be paid for each job have been used, to which has been added social contributions.

No	Profession/ Position	Number of employees	Average monthly gross salary	Social contributions	Monthly personnel expenses	Annual personnel expenses
0	*1*	*2*	*3*	*4=3*31,296%*	*5=2*(3+4)*	*6=5*12*
1.	Director	1	1,600	490	2,090	25,082
2.	Custodian	1	1,200	368	1,568	18,812
3.	Technician	1	1,100	337	1,437	17,244
4.	Guide	2	1,000	245	2,090	25,082
5.	Sales person snack-bar	1	700	214	914	10,974
6.	Cleaning person	1	700	214	914	10,974
7	**Total**	**7**			**9,014**	**108,168**

Social contributions include:

No	Name of the contribution	Weight in the gross salary
1.	Social insurance contribution	20.5 %
2.	Unemployment fund	2.5 %
3.	Health fund	7 %
4.	Holydays and bonuses	0.75 %
5.	Labour accidents	0.546 %
Total		**31.296%**

From the annual total amount for labour expenses, the salaries represent 82,800 RON and the social contributions 25,368 RON.

These expenses are crucial to the viability of the museum since they reflect 60% of the total museum expenses.

15.2.7 The Estimate costs for marketing and advertising

The museum is located in an out of the way area in a small town away from the national highway and it is essential that it is properly promoted if it is to attract visitors.

This can be done in many ways , firstly by placing signs within the locality on the Tg. Jiu – Petrosani national road that would indicate to passing tourists the location of the museum and its importance.

Estimates for the cost of these road signs is approximately 1.000RON and they would have to be replaced every 3 years due to deterioration casued by weather and possibly vandalism.

Another way of promoting the Aninoasa Mine Museum is via an internet web site. The cost of such site is of approximate 1.00 Euro, respectively 3.500 RON and a yearly service cost of 500 RON.

A6 presentation booklets should be published that will promote the touristic character of the area and to encourage students and visitors to take one day trips. The printing costs are 0,1 Euro/booklet. It is anticipated that there will need to be 5.000 copies per year. The costs of these booklets approximately 500 Euro (1750 RON).

The museum should also place advertisements in different specialized publications for tourists (tourism pamphlets, guides etc). Such a campaign would cost approximately 2.000 Euro/year. The purpose of this campaign would be to promote the museum within the big cities at information centres and tourist agencies.

The estimate of the annual expenses for marketing and advertising:

Nr.	Specification	Cost/unit	Nr.	Global Cost
1.	Indicators	10	10	1.000
2.	Site	3.500	1	3.500
3.	Site maintenance	500	1	500
3.	Drawing up booklets	350	1	350
4.	Printing booklets	0,35	5.000	1.750
5.	Advertising in pamphlets	7.000	1	7.000

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Advertising	13.600	9.600	9.600	10.600	9.600	9.600
Increase		0%	0%	0%	0%	0%

	Year 7	Year 8	Year 9	Year 10	**Total**
Advertising	10.600	9.600	9.600	10.600	**103.000**
Increase	0%	0%	0%	0%	

15.2.8 *Estimate of costs for acquiring new exhibits for the museum*

It is very difficult to estimate these costs as they depend on both the curator's ability and the willingness of the mining companies to part with used mining machinery. Transportation costs would also depend on the size of the exhibit being transported and the distance it had to be brought. The museum displays need to be varied on a regular basis in order to attact the most number of visitors.

Therefore an assumption has been made to allot a sum of 10.000 RON/year for such acquisitions and transport with an annual increase of 5%, as the museum develops.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Curator expenses	10.000	10.500	11.025	11.576	12.155	12.763
Increase		5%	5%	5%	5%	5%

	Year 7	Year 8	Year 9	Year 10	**Total**
Curator expenses	13.401	14.071	14.775	15.513	**125.779**
Increase	5%	5%	5%	5%	

15.2.9 *Cleaning expenses*

Being a public area, often visited by children, cleaning is an essential element of the overall expenditure.

It is proposed to allow an amount of 350 RON/month for such expenses with a 5% increse yearly, as the number of visitor increases.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Cleaning expenses	4.200	4.410	4.631	4.862	5.105	5.360
Increase		5%	5%	5%	5%	5%

	Year 7	Year8	Year 9	Year 10	**Total**
Cleaning expenses	5.628	5.910	6.205	6.516	**52.827**
Increase	5%	5%	5%	5%	

15.2.10 *Insurance expenses*

In order to cover the risk of different accidents, the insurance of the goods and buildings is mandatory.

The annual cost of the insurance fee should be 0,5% of the value of all insued goods.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Insurance expenses	4.200	4.410	4.631	4.862	5.105	5.360
Increase		5%	5%	5%	5%	5%

	Year7	Year 8	Year 9	Year 10	Total
Insurance expenses	5.628	5.910	6.205	6.516	**52.827**
Increase	5%	5%	5%	5%	

16 ADMINISTRATIVE ARRANGEMENTS AND SUSTAINABILITY

16.1 Ownership of Museum

Ownership of the museum should ideally be in the hands of those who will pay the major proportion of the upkeep or who's responsibility it is to find additional funding for the museum. In this case the local community has expressed a wish to own the museum and it is they who are likely to fund the ongoing expenses over and above the income generated by the museum. This may be viable but it would also make the museum vulnerable to cuts in the budget should visitor numbers not reach acceptable levels.

There are other options. It may be better for ownership to be in the hands of the Ministry of Culture who would administer it as a National Mining Museum that would not be affected by local variances. This would secure the budget but may bring with it administrative problems between management at local level and National officers. There has been no discernible willingness on the part of the Ministry of Culture to follow this line of ownership.

Another possibility is the mining companies who still have operational mines and who may contribute to the exhibits. In other countries this has not proved successful, as the running of a museum is not seen as core mining business and there is little evidence that the situation is different in Romania. It is also the case that the Hard Coal mining companies are not large in numbers and the museum would be an unacceptable drain on the individual company resources.

It is possible that a charitable trust could be set up to administer the museum but in order to do this there would need to be either a source of funding sufficiently large to sustain the museum or evidence that there would be public support for the museum. Nationally there are other more pressing needs than a mining museum and it is likely that the level of support for this would be limited.

16.2 Appointment of the Museum Management

The management of the museum should be appointed by the owners but based on the advice and experience of other museums in similar circumstances such as the National Coal Mining Museum for England. Management should be appointed with consideration to the qualifications required and not who may be available locally.

17 CONCLUSION

The idea of a museum at Aninoasa Mine is laudable. It would provide a focal pont for the hard coal mining community to show to a wider audience the history and experience of what is, without doubt, a difficult and dangerous occupation. Many mining museums have been set up in various countries to show off their mining heritage. It is an unfortunate fact that many of the museums have also been unsustainable because they lack the power to attract a big enough audience in the long term.

The expenditure on the development of a museum has to be carefuly thought out if it is not to be wasted. It needs to be in an area normally fequented by tourists so that it can be part of the areas attractions. It has to be accessible by the local road and rail networks. It has to have sufficient funding from sales of tickets or other sources to be able to support itself.

The planned Aninoasa Museum has the advantage of being able to call on some funding to develop the site as part of its closure programme, thus developing and refurbishing the site at little or no cost to the Museum. However the total figure for refurbishment is over E2,000,000 and it is by no means certain that this level of expenditure would be avialable for this development.

In order to ensure that the museum is not just a group of restored static buildings for which there would be no demand there is a need to develop a modern interactive museum. To do this will involve staffing levels who will develop the museum and have the experience and training to do this. Additonally there will be ongoing costs to ensure that the museum is constantly changing and maintaining its own stock and buildings creating an attraction for the public.

The feasibility study developed a modest option of retaining the most iconic buildings and incorporating ideas that may attract the public, however the criteria expressed above is not readily met by Aninoasa Mine. It is remote from the main roads, accessed by a narrow road that would not be appealing to the general visitor. Tourism in the area is limited and the numbers of visitors that could be expected is also limited . There are no other cultural attractions that would make the argument for increasing the visitor numbers used in the calculations . These are figures currently being enjoyed by the Petrosani Mining Museum.

There are no obvious ongoing funding possibilities although individual projects may funded via the EU or the Romanian Government. These would only pay for any new project and could not be used for ongoing expenses.

The upkeep of the museum would therefore fall on the sale of tickets and the support of the local community. The Cash flow charts indicate a negative cash flow and it is unlikely that the local community would be able to sustain the funding to balance the books in the longer term.

Data on the level of expenditure that may be expected from the local council has not been forthcoming and this feasibility study can therefore only point out what would be required from the local council to support the museum and make it viable once the sales of tickest has been taken into account.

The hope within the community that the museum would actually bring income into the community cannot be proved and in fact the opposite is true. If the community is willing to take on the burden of sustaining the museum then it may be possible to consider it . But this feasibility study has shown that it would not be viable to sustain a mining museum at Aninoasa.

ANNEX 1

Exploration of Museum

Annex 1

CASH_FLOW DIN EXPLOATARE											
Nr.crt.	SPECIFICAȚIE	Estimari pe perioada de previziuni (RON)									
		An1	An2	An3	An4	An5	An6	An7	An8	An9	An10
1	**Venituri din exploatare**	**133,500**	**156,300**	**190,890**	**223,686**	**251,050**	**276,155**	**296,281**	**303,232**	**310,530**	**310,530**
2	**(-)Cheltuieli de exploatare, exclusiv amortizarea, TOTAL, din care*:**	**464,418**	**476,415**	**534,979**	**558,613**	**578,615**	**598,899**	**619,084**	**632,528**	**647,693**	**661,040**
2.1	Cheltuieli cu salariile	108,168	113,576	155,311	163,077	171,231	179,792	188,782	198,221	208,132	218,538
2.2	Cheltuieli cu pregatirea personalului	1,750	1,750	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100
2.3	Cheltuieli cu conferinte, vizite	5,250	5,250	6,300	6,300	6,300	6,300	6,300	6,300	6,300	6,300
2.4	Cheltuieli cu materii prime, materiale si marfuri	53,200	62,475	76,524	89,945	101,271	111,398	119,916	123,160	126,566	126,566
2.5	Cheltuieli de intretinere	5,075	5,329	5,595	5,875	6,169	6,477	6,801	7,141	7,498	7,873
2.6	Cheltuieli service echipamente expuse muzeu	7,000	7,350	7,718	8,103	8,509	8,934	9,381	9,850	10,342	10,859
2.7	Cheltuieli cu utilitatile	218,376	218,376	218,376	218,376	218,376	218,376	218,376	218,376	218,376	218,376
2.8	Cheltuieli cu marketing si publicitate	13,600	9,600	9,600	10,600	9,600	9,600	10,600	9,600	9,600	10,600
2.9	Costuri achizitii alte exponate muzeu	10,000	10,500	11,025	11,576	12,155	12,763	13,401	14,071	14,775	15,513
2.10	Cheltuieli pentru curatenie	4,200	4,410	4,631	4,862	5,105	5,360	5,628	5,910	6,205	6,516
2.11	Cheltuieli cu asigurarea	37,799	37,799	37,799	37,799	37,799	37,799	37,799	37,799	37,799	37,799
4	**= Rezultatul din exploatare (Pierdere)**	**-330,918**	**-320,115**	**-344,089**	**-334,927**	**-327,565**	**-322,744**	**-322,803**	**-329,296**	**-337,163**	**-350,510**
5	(-) Impozitul pe profit (16%)	0	0	0	0	0	0	0	0	0	0
9	(+) sau (-) Variația NFR	0	0	0	0	0	0	0	0	0	0
10	**= Cash flow din exploatare**	**-330,918**	**-320,115**	**-344,089**	**-334,927**	**-327,565**	**-322,744**	**-322,803**	**-329,296**	**-337,163**	**-350,510**

Nota:

1. Amortizarea nu a fost luata in calcul datorita faptului ca investitia nu se recupereaza din profitul net din exploatare, fondurile obtinute pentru amenajarea muzeului fiind nerambursabile.

2. Deoarece rezultatul din exploatare este PIERDERE, nu pot fi calculati indicatorii de profitabilitate si rentabilitate.

Legenda:

Cheltuieli variabile

Cheltuieli fixe

ANNEX 2

Making It Bankable

Annex 2

PRAG DE RENTABILITATE										
Indicator (RON)	**An 1**	**An 2**	**An 3**	**An 4**	**An 5**	**An 6**	**An 7**	**An 8**	**An 9**	**An 10**
Venituri totale (Incasari din vanzarea serviciilor)	**133,500**	**156,300**	**190,890**	**223,686**	**251,050**	**276,155**	**296,281**	**303,232**	**310,530**	**310,530**
Cheltuieli variabile TOTAL, din care:	**201,243**	**213,240**	**270,404**	**294,038**	**314,040**	**334,324**	**354,509**	**367,953**	**383,118**	**396,465**
Cheltuieli cu salariile	108,168	113,576	155,311	163,077	171,231	179,792	188,782	198,221	208,132	218,538
Cheltuieli cu materii prime, materiale si marfuri	53,200	62,475	76,524	89,945	101,271	111,398	119,916	123,160	126,566	126,566
Cheltuieli de intretinere	5,075	5,329	5,595	5,875	6,169	6,477	6,801	7,141	7,498	7,873
Cheltuieli service echipamente expuse muzeu	7,000	7,350	7,718	8,103	8,509	8,934	9,381	9,850	10,342	10,859
Cheltuieli cu marketing si publicitate	13,600	9,600	9,600	10,600	9,600	9,600	10,600	9,600	9,600	10,600
Costuri achizitii alte exponate muzeu	10,000	10,500	11,025	11,576	12,155	12,763	13,401	14,071	14,775	15,513
Cheltuieli pentru curatenie	4,200	4,410	4,631	4,862	5,105	5,360	5,628	5,910	6,205	6,516
Cheltuieli fixe TOTAL, din care:	**263,175**	**263,175**	**264,575**	**264,575**	**264,575**	**264,575**	**264,575**	**264,575**	**264,575**	**264,575**
Cheltuieli cu pregatirea personalului	1,750	1,750	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100
Cheltuieli cu conferinte, vizite	5,250	5,250	6,300	6,300	6,300	6,300	6,300	6,300	6,300	6,300
Cheltuieli cu utilitatile	218,376	218,376	218,376	218,376	218,376	218,376	218,376	218,376	218,376	218,376
Cheltuieli cu asigurarea	37,799	37,799	37,799	37,799	37,799	37,799	37,799	37,799	37,799	37,799
Prag de rentabilitate (%)	***-388.49%***	***-462.20%***	***-332.74%***	***-376.07%***	***-420.03%***	***-454.84%***	***-454.38%***	***-408.79%***	***-364.49%***	***-307.88%***
Interpretare:										
Pragul de rentabilitate reprezinta nivelul de activitate care absoarbe in totalitate cheltuielile de exploatare ale unei perioade, rezultatul fiind NUL.										
Daca veniturile totale ar creste cu pierderea rezultata din activitatea de exploatare, pragul de rentabilitate ar deveni 100%, ceea ce inseamna ca la acest nivel de venituri muzeul isi acopera toate cheltuielile.										

Indicator (RON)	**An 1**	**An 2**	**An 3**	**An 4**	**An 5**	**An 6**	**An 7**	**An 8**	**An 9**	**An 10**
Venituri (Incasari din vanzarea serviciilor)	**133,500**	**156,300**	**190,890**	**223,686**	**251,050**	**276,155**	**296,281**	**303,232**	**310,530**	**310,530**
Alte venituri necesare pentru a compensa pierderea rezultata din activitatea de exploatare, ce pot proveni din:	**330,918**	**320,115**	**344,089**	**334,927**	**327,565**	**322,744**	**322,803**	**329,296**	**337,163**	**350,510**
1. Subventii de la bugetul local (Consiliul Local al Orasului Aninoasa)	**274,165**	**263,362**	**287,336**	**278,174**	**270,812**	**265,991**	**266,050**	**272,543**	**280,410**	**293,757**
2. Finantari si sponsorizari de la societati comerciale si persoane fizice (1000 RON/luna)	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000
3. Redirection area a 2% din impozitul pe profit (**Vezi Nota1**)	44,753	44,753	44,753	44,753	44,753	44,753	44,753	44,753	44,753	44,753
TOTAL VENITURI	**464,418**	**476,415**	**534,979**	**558,613**	**578,615**	**598,899**	**619,084**	**632,528**	**647,693**	**661,040**
Cheltuieli variabile TOTAL, din care:	**201,243**	**213,240**	**270,404**	**294,038**	**314,040**	**334,324**	**354,509**	**367,953**	**383,118**	**396,465**
Cheltuieli cu salariile	108,168	113,576	155,311	163,077	171,231	179,792	188,782	198,221	208,132	218,538
Cheltuieli cu materii prime, materiale si marfuri	53,200	62,475	76,524	89,945	101,271	111,398	119,916	123,160	126,566	126,566
Cheltuieli de intretinere	5,075	5,329	5,595	5,875	6,169	6,477	6,801	7,141	7,498	7,873
Cheltuieli service echipamente expuse muzeu	7,000	7,350	7,718	8,103	8,509	8,934	9,381	9,850	10,342	10,859
Cheltuieli cu marketing si publicitate	13,600	9,600	9,600	10,600	9,600	9,600	10,600	9,600	9,600	10,600
Costuri achizitii alte exponate muzeu	10,000	10,500	11,025	11,576	12,155	12,763	13,401	14,071	14,775	15,513
Cheltuieli pentru curatenie	4,200	4,410	4,631	4,862	5,105	5,360	5,628	5,910	6,205	6,516
Cheltuieli fixe TOTAL, din care:	**263,175**	**263,175**	**264,575**	**264,575**	**264,575**	**264,575**	**264,575**	**264,575**	**264,575**	**264,575**

Annex 2

PRAG DE RENTABILITATE										
Indicator (RON)	**An 1**	**An 2**	**An 3**	**An 4**	**An 5**	**An 6**	**An 7**	**An 8**	**An 9**	**An 10**
Cheltuieli cu pregatirea personalului	1,750	1,750	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100
Cheltuieli cu conferinte, vizite	5,250	5,250	6,300	6,300	6,300	6,300	6,300	6,300	6,300	6,300
Cheltuieli cu utilitatile	218,376	218,376	218,376	218,376	218,376	218,376	218,376	218,376	218,376	218,376
Cheltuieli cu asigurarea	37,799	37,799	37,799	37,799	37,799	37,799	37,799	37,799	37,799	37,799
Prag de rentabilitate (%)	***100.00%***	***100.00%***	***100.00%***	***100.00%***	***100.00%***	***100.00%***	***100.00%***	***100.00%***	***100.00%***	***100.00%***

ANNEX 3

Worst Case

Sensitivity Analysis Income Reduced 5%

Annex 3

SCENARIU PESIMIST											
ANALIZA DE SENZITIVTATE LA SCADEREA VENITURILOR DIN EXPLOATARE CU 5%											
Nr.crt.	SPECIFICAȚIE	Estimari pe perioada de previziuni (RON)									
		An1	An2	An3	An4	An5	An6	An7	An8	An9	An10
1	**Venituri din exploatare**	**126,825**	**148,485**	**181,346**	**212,502**	**238,498**	**262,347**	**281,467**	**288,070**	**295,004**	**295,004**
2	**(-)Cheltuieli de exploatare, exclusiv amortizarea, TOTAL, din care*:**	**464,418**	**476,415**	**534,979**	**558,613**	**578,615**	**598,899**	**619,084**	**632,528**	**647,693**	**661,040**
2.1	Cheltuieli cu salariile	108,168	113,576	155,311	163,077	171,231	179,792	188,782	198,221	208,132	218,538
2.2	Cheltuieli cu pregatirea personalului	1,750	1,750	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100
2.3	Cheltuieli cu conferinte, vizite	5,250	5,250	6,300	6,300	6,300	6,300	6,300	6,300	6,300	6,300
2.4	Cheltuieli cu materii prime, materiale si marfuri	53,200	62,475	76,524	89,945	101,271	111,398	119,916	123,160	126,566	126,566
2.5	Cheltuieli de intretinere	5,075	5,329	5,595	5,875	6,169	6,477	6,801	7,141	7,498	7,873
2.6	Cheltuieli service echipamente expuse muzeu	7,000	7,350	7,718	8,103	8,509	8,934	9,381	9,850	10,342	10,859
2.7	Cheltuieli cu utilitatile	218,376	218,376	218,376	218,376	218,376	218,376	218,376	218,376	218,376	218,376
2.8	Cheltuieli cu marketing si publicitate	13,600	9,600	9,600	10,600	9,600	9,600	10,600	9,600	9,600	10,600
2.9	Costuri achizitii alte exponate muzeu	10,000	10,500	11,025	11,576	12,155	12,763	13,401	14,071	14,775	15,513
2.10	Cheltuieli pentru curatenie	4,200	4,410	4,631	4,862	5,105	5,360	5,628	5,910	6,205	6,516
2.11	Cheltuieli cu asigurarea	37,799	37,799	37,799	37,799	37,799	37,799	37,799	37,799	37,799	37,799
4	**= Rezultatul din exploatare (Pierdere)**	**-330,918**	**-320,115**	**-344,089**	**-334,927**	**-327,565**	**-322,744**	**-322,803**	**-329,296**	**-337,163**	**-350,510**
5	(-) Impozitul pe profit (16%)	0	0	0	0	0	0	0	0	0	0
9	(+) sau (-) ***Variația*** NFR	0	0	0	0	0	0	0	0	0	0
10	**= Cash flow din exploatare**	**-330,918**	**-320,115**	**-344,089**	**-334,927**	**-327,565**	**-322,744**	**-322,803**	**-329,296**	**-337,163**	**-350,510**

Nota:

1. Amortizarea nu a fost luata in calcul datorita faptului ca investitia nu se recupereaza din profitul net din exploatare, fondurile obtinute pentru amenajarea muzeului fiind nerambursabile.

2. Deoarece rezultatul din exploatare este PIERDERE, nu pot fi calculati indicatorii de profitabilitate si rentabilitate.

ANNEX 4

Worst Case

Sensitivity Analysis Income Reduced 10%

Annex 4

SCENARIU PESIMIST											
ANALIZA DE SENZITIVTATE LA SCADEREA VENITURILOR DIN EXPLOATARE CU 10%											
Nr.crt.	SPECIFICAȚIE	Estimari pe perioada de previziuni (RON)									
		An1	An2	An3	An4	An5	An6	An7	An8	An9	An10
1	**Venituri din exploatare**	**120,150**	**140,670**	**171,801**	**201,317**	**225,945**	**248,540**	**266,653**	**272,909**	**279,477**	**279,477**
2	**(-)Cheltuieli de exploatare, exclusiv amortizarea, TOTAL, din care*:**	**464,418**	**476,415**	**534,979**	**558,613**	**578,615**	**598,899**	**619,084**	**632,528**	**647,693**	**661,040**
2.1	Cheltuieli cu salariile	108,168	113,576	155,311	163,077	171,231	179,792	188,782	198,221	208,132	218,538
2.2	Cheltuieli cu pregatirea personalului	1,750	1,750	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100
2.3	Cheltuieli cu conferinte, vizite	5,250	5,250	6,300	6,300	6,300	6,300	6,300	6,300	6,300	6,300
2.4	Cheltuieli cu materii prime, materiale si marfuri	53,200	62,475	76,524	89,945	101,271	111,398	119,916	123,160	126,566	126,566
2.5	Cheltuieli de intretinere	5,075	5,329	5,595	5,875	6,169	6,477	6,801	7,141	7,498	7,873
2.6	Cheltuieli service echipamente expuse muzeu	7,000	7,350	7,718	8,103	8,509	8,934	9,381	9,850	10,342	10,859
2.7	Cheltuieli cu utilitatile	218,376	218,376	218,376	218,376	218,376	218,376	218,376	218,376	218,376	218,376
2.8	Cheltuieli cu marketing si publicitate	13,600	9,600	9,600	10,600	9,600	9,600	10,600	9,600	9,600	10,600
2.9	Costuri achizitii alte exponate muzeu	10,000	10,500	11,025	11,576	12,155	12,763	13,401	14,071	14,775	15,513
2.10	Cheltuieli pentru curatenie	4,200	4,410	4,631	4,862	5,105	5,360	5,628	5,910	6,205	6,516
2.11	Cheltuieli cu asigurarea	37,799	37,799	37,799	37,799	37,799	37,799	37,799	37,799	37,799	37,799
4	**= Rezultatul din exploatare (Pierdere)**	**-330,918**	**-320,115**	**-344,089**	**-334,927**	**-327,565**	**-322,744**	**-322,803**	**-329,296**	**-337,163**	**-350,510**
5	(-) Impozitul pe profit (16%)	0	0	0	0	0	0	0	0	0	0
9	(+) sau (-) ***Variația*** NFR	0	0	0	0	0	0	0	0	0	0
10	**= Cash flow din exploatare**	**-330,918**	**-320,115**	**-344,089**	**-334,927**	**-327,565**	**-322,744**	**-322,803**	**-329,296**	**-337,163**	**-350,510**

Nota:

1. Amortizarea nu a fost luata in calcul datorita faptului ca investitia nu se recupereaza din profitul net din exploatare, fondurile obtinute pentru amenajarea muzeului fiind nerambursabile.

2. Deoarece rezultatul din exploatare este PIERDERE, nu pot fi calculati indicatorii de profitabilitate si rentabilitate.

ANNEX 5

General Bill

Annex 5

CENTRALIZATOR LUCRARI

Nr. crt.	Nr. ob.	Denumire cheltuială (sau deviz pe obiect)	Clădiri		Inst. af. construcției			Montaj ut.	Inst. af. tehnologiei			Ut.si ec.	Utilaj tehn.	TOTAL CAP. 4	din care C+M
			C-tii noi si consolidari	Arh.	Hidro	Termo	El.	tehn.-gic	Hidro	Termo	El.	transp.	cu montaj		
0	1	2	3	4	5	6	7	8	9	10	11	12	13	20	21
1		Atelier electromecanic (spațiu muzeal)	172,942	362,457	340,855	0	0	0	0	0	0	0	0	876,254	876,254
2		Turnul de extracție şi clădirea turnului cu accensoare	86,112	0	0	0	0	0	0	0	0	0	0	86,112	86,112
			119,650	0	0	0	0	0	0	0	0	0	0	119,650	119,650
3		Casa turn extractie	23,779	0	0	0	0	0	0	0	0	0	0	23,779	23,779
4		Casa maşinii (spațiu muzeal)	88,634	86,112	0	0	0	0	0	0	0	0	0	174,746	174,746
5		Pavilion acoperit pentru depozitul de explozivi – Construcții şi instalații (construcție nouă)	72,600	0	0	0	0	0	0	0	0	0	0	72,600	72,600
6		Estacadă acoperită – Construcții şi instalații (construcție nouă)	43,000	0	0	0	0	0	0	0	0	0	0	43,000	43,000
7		Expoziție în aer liber (platforma nouă)	105,750	0	0	0	0	0	0	0	0	0	0	105,750	105,750
8		Remiză locomotivă (spațiu muzeal nou) – Lucrări arhitectură	48,797	94,839	0	0	0	0	0	0	0	0	0	143,636	143,636
9		Stația de salvare (spațiu muzeal) – Lucrări arhitectură	28,846	24,840	0	0	0	0	0	0	0	0	0	53,686	53,686
10		Ob. 1 - CONSOLIDARE TUNEL ANINOASA-PISCU	258,153	0	0	0	0	0	0	0	0	0	0	258,153	258,153
11		Ob. 2 - EXECUTIE GALERIE ACCES DEPOZIT EXPLOZIV	69,190	0	0	0	0	0	0	0	0	0	0	69,190	69,190
12		Ob. 3 - AMENAJARE TUNEL ANINOASA-PISCU	106,962	0	0	0	0	0	0	0	0	0	0	106,962	106,962
13		Ob. 4 - AMENAJARE SPATIU CIRCULATIE SUITOR AERAJ L=40m	11,349	0	0	0	0	0	0	0	0	0	0	11,349	11,349
Total INVESTITIE DE BAZA (CAP. 4 din DEVIZ GENERAL)			**1,235,764**	**568,248**	**340,855**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2,144,867**	**2,144,867**

	ALTE CHELTUIELI (cap. 5 din Devizul General) (EUR)		
5.1	Org. şantier (2,5% din C+M), din care:	53,622	
5.1.1	Lucrări construcții	26,811	
5.1.2	Cheltuieli conexe organizării şantierului	26,811	
5.2	Comisioane,taxe, şi cote legale	10,724	
5 a)	Comision bancă rom.	0	
b)	Comision vamal (0,5% din import)	0	
c)	Taxe vamale (10% din import)	0	
d)	Taxa prot.soc.constr. (0,5% din C+M)	10,724	
	Costuri de finanțare-costul creditului (dobânda)	0	
5.3	Cheltuieli diverse şi neprevăzute (5% din inv. bază + ch.pr. + As.T.țară)	109,593	
	Total cap. 5 - Alte cheltuieli	**173,939**	

LEGENDA:

- **lucrari constructii**
- **lucrari consolidare**
- **lucrari arhitectura**

Annex 5

NOTA 1:

Venit anual din redirectionarea a 2% din impozitul pe profit (16%)

Indicator	*Nr locuitori*
Locuitori Judet Hunedoara *	526,165
Populatie activa din total populatie Judet Hunedoara (44,3%) *	233,091
Populatie activa care doreste sa redirectioneze 2% din impozitul pe profit muzeului (5% din populatia activa)	2,331

Indicator	*Valori*
Venit mediu brut (RON) / locuitor	500
Venit mediu brut (RON) Total	1,165,455
Impozit / luna (RON)	186,473
Redirectionarea a 2 % din impozitul pe profit (RON) / luna	3,729
Redirectionarea a 2 % din impozitul pe profit (RON) / an	**44,753**

Sursa de informatie* :

1.Numarul de locuitori este preluat din Situatiile Statistice la nivelul judetului Hunedoara.

2.Coeficientul care exprima gradul de ocupare a populatiei active din judetul Hunedoara este preluat din studiul realizat de Romanian Business Digest 2005.

Annex 5

DEVIZ GENERAL			
PRIVIND CHELTUIELILE DE CAPITAL NECESARE REALIZĂRII OBIECTIVULUI: "MUZEU ANINOASA"			
		NIVEL DE PREȚ :	15 June 2006
		CURS VALUTAR (RON/EURO):	3.5246
Nr. crt.	Denumirea capitolelor de cheltuieli	Valoarea totală (exclusiv TVA)	
		Total	
		EUR	RON
1	2	3	4
	PARTEA I		
	CAPITOLUL 1		
	Cheltuieli pentru obținerea şi amenajarea terenului		
1.1	Obținerea terenului	0	0
1.2	Amenajarea terenului (Drumuri si parcaje)	34,690	122,268
1.3	Amenajări pentru protecția mediului	0	0
	TOTAL CAPITOL 1	**34,690**	**122,268**
	CAPITOLUL 2		
Cheltuieli pentru asigurarea utilităților necesare obiectivului		0	0
	TOTAL CAPITOL 2	**0**	**0**
	CAPITOLUL 3		
	Cheltuieli pentru proiectare şi asistenta tehnică		
3.1	Studii de teren	0	0
3.2	Obținerea de avize, acorduri şi autorizații (1,1% din C+M)	23,594	83,158
3.3	Proiectare şi engineering	47,000	165,656
3.4	Organizarea procedurilor de achiziție publică	0	0
3.5.	Consultanță	0	0
3.6	Asistență tehnică	0	0
	TOTAL CAPITOL 3	**70,594**	**248,814**
	CAPITOLUL 4		
	Cheltuieli pentru realizarea investiției de bază		
4.1	Construcții şi instalații aferente	2,144,867	7,559,798
4.2	Montaj utilaj tehnologic şi instalații aferente tehnologiei	0	0
4.3	Utilaje, echipamente tehnologice şi functionale cu montaj	0	0
4.4	Utilaje fără montaj şi echipamente de transport	0	0
4.5	Dotări	0	0
	TOTAL CAPITOL 4	**2,144,867**	**7,559,798**
	CAPITOLUL 5		
	Alte cheltuieli		
5.1	Organizare de şantier (aprox. 2,5% din C+M)	53,622	188,995
	5.1.1. Lucrări de construcții	*26,811*	*94,497*
	5.1.2. Cheltuieli conexe organizării şantierului	*26,811*	*94,497*
5.2	Comisioane, taxe,cote legale, costuri de finanțare	10,724	37,799
	5.2.1. Comisioane, taxe şi cote legale (com. bancă, com vamal=5%din import, taxe vamale=10%din import,taxă prot.soc. Constructori=0,5% din C+M)	*10,724*	*37,799*
	5.2.2. Costul creditului (dobândă)	*0*	*0*
5.3	Cheltuieli diverse şi neprevăzute (5% din inv. bază + ch.pr. + As.T.țară)	109,593	386,273
	TOTAL CAPITOL 5	**173,939**	**613,067**
	CAPITOLUL 6		
	Cheltuieli pentru darea în exploatare		
6.1	Pregătirea personalului de exploatare	497	1,750
6.2	Probe tehnologice	0	0
	TOTAL CAPITOL 6	**497**	**1,750**

Annex 5

TOTAL PARTEA I	**2,424,586**	**8,545,697**
Din care, C + M	2,144,867	7,559,798
TVA PARTEA I (19%)	460,671	1,623,682
TOTAL PARTEA I CU TVA	**2,885,258**	**10,169,379**
Din care, C + M	**2,552,392**	**8,996,160**
PARTEA A II-A		
Valoarea ramasă actualizată a mj.fixe existente incluse în cadrul obiectivului de investiție (valori nesemnificative)	0	0
PARTEA A III-A		
Fondul de rulment necesar pentru primul ciclu de producție	48,464	170,816
TVA PARTEA III (19%)	9,208	2,613
TOTAL PARTEA III CU TVA	**57,672**	**173,428**
TOTAL GENERAL, fără T.V.A.	**2,473,050**	**8,716,512**
Din care, C + M	**2,144,867**	**7,559,798**
Din care,		
TOTAL DE FINANȚAT(PARTEA I+III)	**2,473,050**	**8,716,512**
CU TVA :	**2,942,930**	**10,342,807**

Wardell Armstrong
Engineering & Environmental Solutions