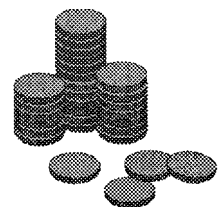

State Committee on Geology and Utilization of Mineral Resources of Ukraine
"Goscomgeology"

State Informational Geological Fund of Ukraine
"Geoinform"

BUSINESS PLAN

(prefeasibility estimation of Tyvrovskoe deposit of granite)

Kyiv - 1996



TYVROVSKOE DEPOSIT OF GRANITE

GENERAL INFORMATION

It is situated in Tyvrovo district, Vinnitsa oblast, Ukraine, 20 km apart from the city of Vinnitsa, 1.0-1.2 km from the district's centre town of Tyvrovo, 15 km from the nearest railway station of Gnivan'. The deposit is connected by the highway with the oblast's centre city of Vinnitsa. There is dense highway web in the area of the deposits. The climate of the area is moderate-continental, mild in winter and warm in summer.

Yearly average temperature is 1-7 degrees above zero. Yearly rainfall estimates to be 500-550 mm.

The mineral deposit is represented by middle-coarse green-greyish granite and black gabbro-amphibolite. The deposit is opened up to 32-41 m deep. Overburden represents soil, small-coursed sand and weathered granite up to 7-8 m thick.

Both granite and gabbro-amphibolite are apt to be polished well easily accepting unruffled surface of uniform green-greyish color with green or blue shadows. They are suitable for facing. The block's recovery amounts to 38%.

The deposit has been explored on the area of 7.49 ha.

The reserves of 2706.1 cubic m were estimated in 1973 by the Protocol UTKZ No 3530 as of 30th day of October, the following categories A | 355.1, B -271.1 and C1- 2079.9 are included.

Since 1978 till 1995 Tyvrovskoe deposit was under operation of Vinnitsa Integrated Plant. 164.1 thousand cubic metres of commodity have been mined during that period. At this moment the deposit is not exploited because of the financing problem. In 1996 "MOCOS" private industrial-commercial company received a permission to mine the deposit State license No 579 as of 18.07.1996.

The reserves as of 01.01.96 are amounted to be 2542 cubic metres including the categories: A | 310, B - 171, c1 - 2061.

An increase of reserves is possible as to the depth as over the area.

US \$20 mln are needed to restart mining. An investment promises to be paid profitably (see text and appendix).

Tyvrovskoe deposit of granite

1. Location.

Vinnitsa oblast, Tyvrovsky district, 20 km apart from the city of Vinnitsa.

2. Mineral resources.

Granite, gabbro-amphibolite.

3. Ownership.

Private industrial-commercial firm "MICOS".

4. Infrastructure.

The district centre, town of Tyrov, is situated 11.2 km south-eastwards from the deposit. Nearest railway station of Gnivan' is 15 km apart from the deposit.

The deposit is connected by the highway with the oblast's centre city of Vinnitsa. There is dense highway web in the area of the deposit.

The area is attributed to densely populated part of Ukraine where agricultural sector of the economy is highly developed. In large industrial centre of Vinnitsa there are machinery construction and metal-working factories, food and light industry plants as well as building material enterprises.

5. Statute of project.

Detail exploration was carried out in 1973. 17 wells in diameter 132 and 112 mm have been drilled on web 50 x 75, 75 x 150 and 100-200 x 300 m. 106 samples have been studied and 4 technological blocks have been tested. Granite is suitable for facing, architectural design and also may be applied as both crushed and rubble stones.

6. Source of information.

Ukrainian State Geological Fund "Geoinform": 16 Eugene Potie Str., Kyiv 252057 (Tel: 044 446 6061; Fax: 044 228 622 1).

7. Geology.

The deposit is represented by massive and slightly weathered middle-coarsed granite and gabbro-amphibolite of Podolsky complex and Quarternary sand-clayish formations.

Granites occupy the all area of the deposit and include small bodies of xenolites. Overburden represents soil, loam and small-coarsed sand. Commercial recovery of rock blocks amounts 38%.

8. Mineralization.

There are two differences in rocks: middle-coarsed pegmatoid green-greyish granite and granitised small-coarsed dark-grey and black gabbro-amphibolite.

Granite consists of plagioclase -57-75%; potassic feldspar - up to 5%; quartz - up to 30%; hypersten - 7%; biotite -1-3%.

Gabbro-amphibolite consists of plagioclase - 48%; clinopyroxene - up to 84%; hornblend -20-13%; biotite.

9. Size of deposit.

Explored area has polygonal shape, stretched from SE to NW direction on a distance 500-600 m with 300-350 m width. Total area 7.49 ha. Elevation is from 243.1 to 252.3 m above the sea level.

10. Reserves.

The reserves have been estimated and proved by the Protocol of UTKZ N 3530 as of 30.10.1973 by the following categories (th. cub. m.): A - 355.1, B - 271.1, C₁- 2073.9, A+B+C₁- 2706.1. The rest, as of 01.01.96, are A+B+C₁ -2542; A - 310, B -171, C₁- 2001.

11. Technological properties.

Both laboratory and industrial tests have proved suitability of the commodity for facing. Granite is apt to be polished well accepting unruffled surface of homogenous dark-grey color with green and blue shadows. Both Blue and smoked quartz grains improve the ornamental quality of the granite.

12. Method of mining.

Open pit.



Brief financial study of project

Capital costs and investments

US \$ min.

| Costs | Investments |
|---|---------------|
| Preparation and co-ordination of the project | 10 |
| Menedgment surves | 100 |
| Planning work on open pit with the capacity of 10 th. cub. m. (blocks). | 10 |
| Prospecting works on the site of the factory | 10 |
| Exploration | 30 |
| Planning work on the building of the factory | 30 |
| Mining facility during 1 year of mining | 1869 |
| Technological facility of the pit | 150 |
| Crane for technological works in the pit | 350 |
| Safeguarding | 20 |
| Engineering network construction | 400 |
| Preparation activity for mining | 50 |
| Mining complex construction | 2000 |
| Shop and storehouse construction | 400 |
| Boiler-house facility | 400 |
| Technological machinery for production of thin slab during 9 months | 11450 |
| Transportation machinery | 200 |
| Computers | 50 |
| Wind power | 350 |
| Adaptetion expenses | 10 |
| Starting and adjustment operations (5%) | 700 |
| Servise during 1 year. (10%) | 1400 |
| TOTAL | 20.000 |

Exploitation costs

th. US \$

| Costs | Year | | | | | |
|--|------|-------------|-------------|-------------|-------------|--------------|
| | 1 | 2 | 3 | 4 | 5 | Total |
| Mining of blocks in pit (all expenses) | 50 | 130 | 200 | 250 | 250 | 830 |
| Electricity supply | | 45 | 70 | 90 | 90 | 295 |
| Heating | | 35 | 60 | 70 | 70 | 235 |
| Wages (including extra) | | 520 | 520 | 520 | 520 | 2080 |
| Materials, tools | | 1140 | 3128 | 4468 | 4468 | 13204 |
| Amortization of the machinery (15%). | | 1600 | 1600 | 1600 | 1600 | 6400 |
| Amortization of buildings (4%) | | 112 | 112 | 112 | 112 | 448 |
| Remount service of the facility | | 250 | 400 | 500 | 500 | 1650 |
| Over-head expenses (5% from costs of the commodity). | | 120 | 200 | 250 | 250 | 820 |
| Total (US \$ mln.) | | 3,95 | 6,29 | 7,86 | 7,86 | 25,96 |

Schedule of the production

| Production process | year | | | | | |
|------------------------------------|------|-----|-------|------|------|-------|
| | 1 | 2 | 3 | 4 | 5 | Total |
| Mining of blocks in pit th. cub. m | 1,8 | 6,0 | 9,6 | 12,0 | 12,0 | 31,5 |
| Thin slab production th. sq. m | | 180 | 288 | 360 | 360 | 1188 |
| Production costs prognosis | | | | | | |
| 40% domestic market 60% export | | | | | | |
| Cost of 1 sq. m. of thin slab \$ | 45 | 45 | 45 | 45 | 45 | |
| Cost of commodity output \$ mln | | 8,1 | 12,96 | 16,2 | 16,2 | 53,46 |

Balance of costs on project and functioning of production

| Paragraph of balance | year | | | | | |
|---------------------------|-------|------|-------|-------|-------|-------|
| | 1 | 2 | 3 | 4 | 5 | Total |
| Production sell th. sq. m | | 180 | 288 | 360 | 360 | 1188 |
| Turnover from sell \$ mln | | 8,10 | 12,96 | 16,20 | 16,20 | 53,46 |
| Investments \$ th | 20000 | | | | | |
| Credit rate &.5%) \$ th | | 3000 | 1500 | 1500 | 1500 | 7500 |
| Credit \$ th | | | 3000 | 7000 | 10000 | 20000 |
| Revenue | | | | | | 0,00 |

Payback period is 5 years. Paying rate on the project stage is 20%. Investments will be payed progressively within 3d and 5th years. Credit rate will be paid yearly including 1 th year.

| Loan | | | | | | | | | | | | | | |
|--|-----------|--------------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------------|
| Loan capital | US \$ th. | 20000 | | | | | | | | | | | | |
| Loan rate | (%) | 0,00% | 15,00% | 7,50% | 7,50% | 7,50% | 0,00% | 0,00% | 0,00% | 0,00% | 0,00% | 0,00% | 0,00% | |
| Unpaid rate at the beginning of the year | US \$ th. | 0 | 20000 | 20000 | 17000 | 10000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Cashed part of loan | US \$ th. | | | 3000 | 7000 | 10000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Debts at the end of the year. | US \$ th. | 20000 | 20000 | 17000 | 10000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Loan rate for payment | US \$ th. | 0 | 3000 | 1500 | 1500 | 1500 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Cash flow | | | | | | | | | | | | | | |
| Year of production | | | -1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Revenue from sell | US \$ th. | 0,0 | 8100,0 | 12960,0 | 16200,0 | 16200,0 | 16200,0 | 16200,0 | 16200,0 | 16200,0 | 16200,0 | 16200,0 | 16200,0 | 150660 |
| Capital costs | US \$ th. | 19989,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 19989 |
| Loan | US \$ th. | 20000,0 | | | | | | | | | | | | |
| Exploitation costs | US \$ th. | 0,0 | 3952,0 | 6290,0 | 7860,0 | 7860,0 | 7860,0 | 7860,0 | 7860,0 | 7860,0 | 7860,0 | 7860,0 | 7860,0 | 73122 |
| Loan rate | US \$ th. | 0,0 | 3000,0 | 1500,0 | 1500,0 | 1500,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 7500 |
| Cashed part of loan | US \$ th. | 0,0 | 0,0 | 3000,0 | 7000,0 | 10000,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 20000 |
| cash flow | US \$ th. | -19989,0 | 1148,0 | 2170,0 | -160,0 | -3160,0 | 8340,0 | 8340,0 | 8340,0 | 8340,0 | 8340,0 | 8340,0 | 8340,0 | 30049 |
| Payback period | year | | | | | | 4,1 | | | | | | | 4 |
| Internal rate of return | (%) | < | < | < | < | | 12,57% | 20,61% | 25,39% | 28,39% | 30,34% | 31,64% | 32,53% | |

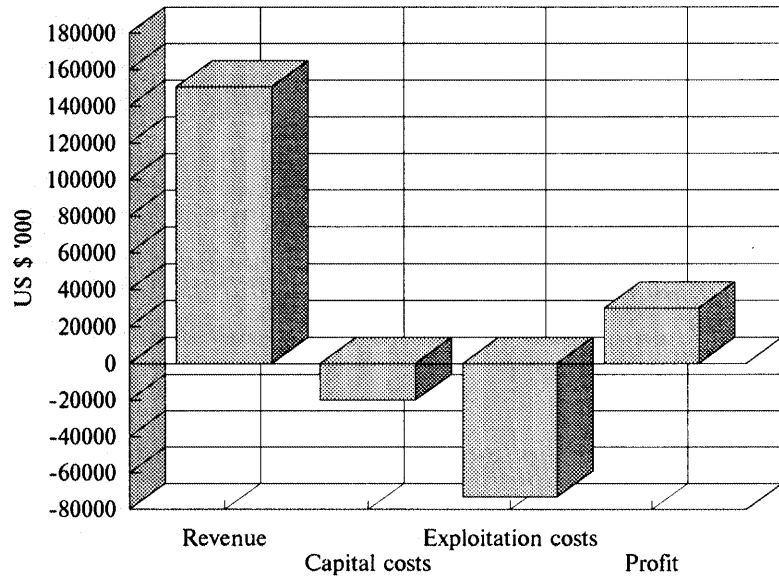
| Result | | Basic variant | |
|--|-------------------------|----------------------|----------------|
| Estimated internal rate of return | (%) | 40,00% | 40,00% |
| Internal rate of return | (%) | 32,53% | 32,53% |
| Cash flow | US \$ th. | 30049,0 | 30049,0 |
| Payback period | year | 4 | 4 |
| Net present value | 10,00% US \$ th. | 4889,5 | 4889,5 |

Sensibility analysis

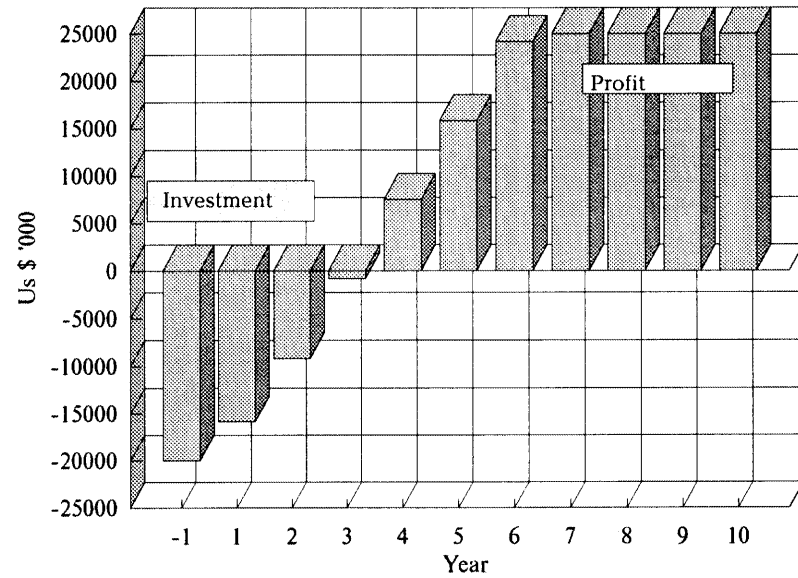
| | |
|---------------------------|-------|
| Price change | 0,00% |
| Capital costs change | 0,00% |
| Exploitation costs change | 0,00% |

Cash flow (10 years) Tyrovskoe deposit Granite

Correlation of revenue and expenditures



Profit



Sensibility analysis (risk analysis) Tyvrovskoe deposit Granite

