# HIGHER TECHNICAL INSTITUTE

## CIVIL ENGINEERING DEPARTMENT

# DIPLOMA PROJECT

# MINING IN CYPRUS: TECHNICAL AND HISTORICAL OVERVIEW

This project is submitted in partial fulfillment of the requirements for the award of the Diploma in Civil Engineering

C/1007

Project Supervisor: Dr Nicholas Kathijotes

IMPLEMENTED BY:

## **EPAMINONDA EPAMINONDAS**

**JUNE 2006** 

HIGHER TECHNICAL INSTITUTE PROJECT NO 3631

#### **Introduction**

Mining is the extraction of valuable materials or other geological materials from the earth, usually from an ore body, vein, or seam. Most substances obtained from the earth are gotten by mining. Any material that cannot be grown from agricultural processes must be mined.

There are many methods for mining, dependent on where and how a mineral deposit is found. Some substances are mined relatively easy because they can be found at or near the earth's surface. Some minerals are found as a compact mass, while others are widely scattered. Other mined materials are found far beneath the surface and removed by tunnelling deep underground. Some mined substances are located beneath oceans, lakes, and rivers. Other minerals are concentrated in large bodies of water and are obtained by pumping. Cyprus mining activity was mainly for producing metals like copper, iron pyrites, gold, chromate, magnesite and asbestos. Since the fourth millennium B.C., Cyprus was one of the most active mining areas, especially in copper. Prove of that is the slag found in many places all over Cyprus, and of course old mines. In modern times, Cyprus continued its good tradition in mining. Since the beginning of the 20<sup>th</sup> century, time when foreign mining companies arrived, Cyprus became once again a rich and active mining area. Mines were scattered all over Cyprus, employing thousands of Cypriots. Skouriotissa, Mitsero, Kalavasos, Troodos are the biggest and richest mining areas in Cyprus.

Due to some reasons, since 1970 mining industry in Cyprus has been on a decline. There was a time that all mines ceased to work. In 1996 and since then the Phoenix Mine in Skouriotissa is the only one operating.

The long mining history of Cyprus has badly affected the environment. The Geological Survey is attempting to minimize environmental impact by actively being involved in environmental rehabilitation projects of deserted mines and environmental impact assessment studies of existing or future activities. Rehabilitation of the Asbestos mine in the mountainous region involves environmental and health issue studies as well as extensive re-profiling of the tailings for stabilization and reforestation purposes.

## LIST OF CONTENTS

	nowledgments3
Intro	oduction4
CHA	APTER 1: MINING IN CYPRUS (6 - 51)
1.1	Cyprus Mining Activity Today7
1.2	Historical Overview of mining areas in Cyprus8
	1.2.1 Copper mining in Cyprus9
	1.2.2 Chromate mining in Cyprus38
	1.2.3 Asbestos mining in Cyprus42
	1.2.4 Magnesite mining in Cyprus49
CHA	APTER 2: MINING TECHNIQUES (52 - 66)
2.1	Steps in the mining process53
2.2	Mining Techniques55
	2.2.1 Surface Mining55
	2.2.1 Underground Mining64
СНА	APTER 3: MINING ENVIROMENTAL EFFECTS (67 - 78)
3.1	Introduction68
3.2	Environmental Impacts of Mining70
CHA	APTER 4: MINING RECLAMATION (79 - 86)
4.1	Introduction80
4.2	Reclamation Process81
4.3	Minimum Standards of Reclamation84
4.4	Reclamation Goals85
CHA	APTER 5: ECOLOGICAL EVALUATION OF THE ASBESTOS MINE (79 - 112)
5.1	The need for Rehabilitation88
5.2	Ecological Features of the area90
5.3	Rehabilitation of the Mine92
5.4	General110
5.5	Management Implications111
REF	ERENCES