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PROJECT REPORT

Topic: **ORGANISATIONAL STRUCTURAL DESIGN OF GHANAIAN MINES - A CONTEMPORARY APPROACH**

PROJECT REPORT SUBMITTED IN PARTIAL

FULFILLMENT OF THE REQUIREMENTS FOR THE

POSTGRADUATE (PROFESSIONAL) DIPLOMA DEGREE IN MINING ENGINEERING

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DEDICATION

Dedicated to my Heavenly father....

A faithful, covenant-keeping God who keeps covenant to a thousand generations with those who love him!

To my special well wishing mum, Madam Apisinini and loved one Miss Scholastica.

And to the much cherished and reliable families of Azuah and Wompakiah.

ABSTRACT

No single workable organisational structure can stand the test of all times; that is, it cannot be mechanistic or static but rather dynamic. Implicitly then, a review of such structures with particular reference to the Ghanaian mining environment is then necessary in the light of such things as modern technology, education, environmental concerns, expansions, etc.

In order to design more suitable structures for our mines, information gathered through interviews and organisation charts has been carefully and systematically analysed in this work.

The result of this has been a recommendation of new organisational structures with the view to clarifying roles, minimising costs, minimising levels in the hierarchy and maximising the spans of control, introduction and removal of certain positions, etc.

Because the proposed structures must function in real life situations, certain limitations have been stated so that modifications could be effected to suit individual mines.

Contingency theories, systems' approach and "optimising" spans of control were adopted. Some contemporary factors, which affect the mines' organisational structures and which have been given due consideration include technology, environment, geotechnical, training, health and safety and marketing.

ACKNOWLEDGMENTS

The success of this work cannot be attributed to the author alone and therefore, the need to express appreciation and gratitude to all, who in diverse ways contributed to the success of this thesis.

First, I am grateful to my God and heavenly father through Christ, who has brought me this far.

Then to my able dear supervisor Mr. Allassan Cobblah for his immeasurable contribution. He readily availed himself to give me advice and relevant information whenever necessary.

I wish also to register my profound appreciation to all mine management personnel that I had to contact for important information through questionnaires or interview while doing this work.

To the Post-graduate Diploma class of 1993, I say thank you for your company.

The last but not the least, to my dear parents, brothers, sisters and friends who for their wonderful concern and love, provided financial and morale support over the years.

May the Lord, my God, richly bless you ; Amen.

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CHAPTER ONE

INTRODUCTION

1.1. PROBLEM DEFINITION

Perhaps there is no more important area of human activity than managing for it is the basic task of all managers at all levels and in all kinds of enterprises to design and maintain an environment in which individuals, working together in groups can accomplish selected missions and objectives (Koontz et. al., 1984).

Organisation will be defined as the structure and process by which a cooperative group of human beings allocates its tasks among its members, identifies relationships, and integrates its activities toward common objectives.This involves the structure of tasks, (organising), the placement of human beings in the structure (staffing) and the integration of the two functions into human systems of activities.

The organisational structures for the mines in Ghana differ from one another. In some mines, these structures have undergone changes over the years in an attempt to get better ones to suit prevailing conditions.

The problems associated with the Ghanaian mines include "improper" positioning of managers and subordinates, absence of some vital positions in our day and overlaps in duties. To avoid confusions and irrational changes in the structures, there is the need to design structures in line with current trends or contemporary issues in management. Some of these issues which have reared their heads and which need to be incorporated in modern organisational structures in Ghana are environmental problems, health and safety, socio-economic, and geotechnical problems, all of which need to be considered.

Such structures should be designed to clarify the organisation so that everyone knows who is to do what and who is responsible for what results, to remove obstacles to performance caused by confusion and uncertainty of assignment, and to furnish a decision making network reflecting and supporting enterprise objectives.

It should be emphasised at this point that managing itself is a part of a large system interacting with the manager's environment - economic, technological, social, and political. What managers do in practice must both reflect and be modified by the real situations in which they operate and the realities they face. The implication is that no universal best way of doing things in all circumstances exists. Thus a workable organisational structure can never be either mechanistic or static, but rather dynamic.

1.2 OBJECTIVES OF RESEARCH

This involves :

a. The study of the current organisational structures of Ghanaian mines.

b. The design of general structures based on contemporary approaches for large and small surface and underground mines in Ghana.

1.3 SCOPE OF RESEARCH

The work is limited to the design of organisational structures for mines in Ghana employing more than hundred persons and whose structures would include a Board of Directors, a Managing Director and a General Manager. It excludes the so called small-scale mining companies.

Due to logistics and availability, only the structures of Prestea Goldfields Limited, (P.G.F.), Billiton Bogosu Gold, (B.B.G.), Ghanaian Australian Gold, (G.A.G.), Ashanti Goldfields Corporation (GH) Limited, (A.G.C.) and Ghana National Manganese Corporation, (G.N.M.C.), would be used for the study and analysis.

1.4. ORGANISATION OF THE REPORT

The work or report has been organised in five main chapters :

Chapter one is the introduction which includes the definition of the problem, the objectives and scope of the research work and organisation of the report.

Chapter two contains the literature review which discusses the principles and theories underlying the methods to be adopted in designing the new general organisation structures for the Ghanaian mines.

Chapter three deals with the description and analysis of the existing organisational structures.

Chapter four focuses on the design and analysis of the proposed organisational structures. Methods adopted, reasons for the modifications, and advantages are also given.
Chapter five outlines the recommendations and conclusions that have been drawn from the work.

CHAPTER TWO

LITERATURE REVIEW

An organisational structure is the pattern of human relationships or structure of roles and grouping of activities in any human organisation for the purpose of achieving enterprise objectives. It could also be seen as depicting authority relationships. Koontz et. al. (1984) also define it as an intentional structure of roles or positions.

2.1. DEPARTMENTATION

The manner in which activities should be divided and formed into specialised groups usually is referred to as departmentation. The purpose of departmentation is to specialise activities, simplify the task of managers, and maintain control. A department therefore designates a distinct area, division, or branch of an enterprise over which a manager has authority for the performance of specified activities. (Koontz et. al., 1984).

They also say, no single method for departmentation applies to all situations and that, the following criteria may help the planner :

1. Similar activities may be grouped together, based upon likeness of personal qualifications or common purpose, for example medical and dental personnel.

2. An activity may be grouped with others with which it is used, for example safety with production.

3. Functions may be assigned to that executive who is most interested in performing them well.

4. Activities may be grouped to encourage competition among departments or to avoid conflicts among departments.

5. If it is difficult to make definite distinctions between two activities, they may be grouped together.

6. Certain functions require close coordination and if separated would increase problems of higher level managers : in this case such functions should be grouped together.

The implication of this is that, the pattern used will depend on the given situations and what managers believe would yield the best results for them in the situation they face.

2.2. TYPES OF DEPARTMENTATION

According to Koontz et. al. (1984), the following types of departmentation exist : Departmentation by numbers, time, function, territory, product, customer, process or equipment, service and market orientation. However, those that exist in the Ghanaian mines and would be discussed briefly are departmentation by function.

2.2.1. Departmentation by Function

Functions of the enterprise form the basis for grouping activities. Currently, it is the most widely practised. Since all undertakings involve the creation of utility and since this occurs in an exchange economy, the basic enterprise functions consist of production (creating utility or adding utility to a good service), selling (finding customers, communicants, etc who will agree to accept the good or service at a price), and financing (raising collecting, safeguarding and expending the funds of the enterprise). Mining is an interdisciplinary venture and in the Ghanaian mines, it has been logical to group these

disciplines into such typical departments as engineering, production, processing, accounting, survey, geology etc. See figure 1.

The most important advantage of functional departmentation is that it is a logical and time proven method. It is also the best way of making certain the power and prestige of the basic activities of the enterprise will be defended by the top managers. This is an important consideration among functional managers, for they see on every side encroachments of staff and service groups which sometimes threaten the security of the principal line executives. (Koontz et. al., 1984). Another advantage is that it follows the principle of occupational specialisation, thereby making for efficiency in the utilisation of the workforce. Still other advantages are that it simplifies training and because the top managers have end- results responsibilities, furnishes a means of tight control at the top.

In spite of the advantages, there are times when the claims of other methods supersedes it. The size of the geographic area over which an enterprise operates may call for territorial production experts. (Koontz et. al., 1984).

Through this type of differentiation, they develop attitudes and other behaviourial patterns involving loyalty to a function rather than to the enterprise as a whole. Such "walls" between functional departments are common and require considerable efforts toward integration.

Another disadvantage is that only the chief executive is responsible for profits. In small firms, this is as it should be, but in large firms the burden would be too heavy for an individual to bear. What is perhaps most important is that since the first general managerial position is that of the general manager, the functionally organised company is not the best training ground for promotable top management employees. (Koontz et. al., 1984).

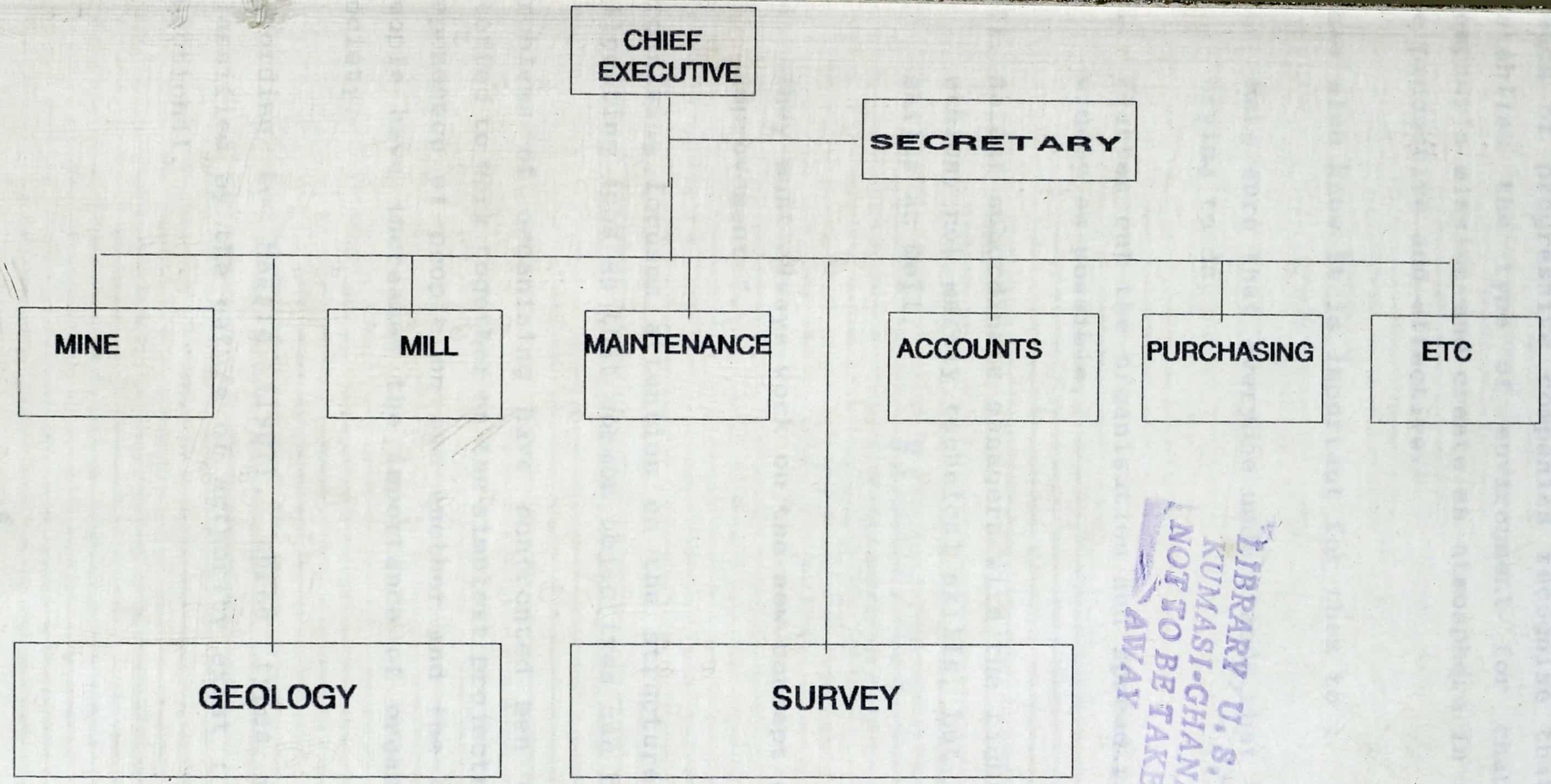


Figure 1, Functional organisation.

2.3. ORGANISING AND ORGANISATIONAL STRUCTURAL DESIGN

Heads of progressive companies recognise that only they can establish the type of environment for change, define the company's mission and create an atmosphere in which people can be productive and effective.

They also know it is important for them to :

i. Make sure that everyone understands what the company is trying to do,

ii. Flatten out the organisation and spread responsibility as widely as possible,

iii. Select subordinate managers with the right skills and ethics, not merely technical skills, but interpersonal skills as well,

vi. They must always work on the new concept of " continuous improvement ".

Organising focuses attention on the structure and process of allocating jobs so that common objectives can be achieved.

Problems of organising have confronted men ever since they started to work together on the simplest projects. The increasing dependence of people on one another and the concentration of people have increased the importance of organising in modern society.

According to Massie (1987), three types of organisation classified by the nature of authority exist : Line, staff and functional.

Line organisation is the simplest, most direct type, in which each position has general authority over lower positions in the hierarchy in the accomplishment of the main operations of the firm. Staff organisation is purely advisory to the line structure, with no authority to place recommendations into action. Staff becomes necessary when the line needs advisory help, yet in effect, it complicates the supervision problem faced by the line manager. Functional organisation decreases the line manager's problem because it permits orders to flow directly to the lower levels without attention to routine technical problems by the line positions.

2.3.1. Classical Principles of Organisation

These were developed by traditional organizational theorists and are considered as useful first approximations, or guides for thought in the organising function. The most important of these as observed by Massie (1987), are :

1. Unity of command,

2. Exception principle,

3. Span of control,

4. Scalar principle,

5. Departmentation and

6. Decentralisation.

2.3.1.1. Unity of Command

The principle states that no member of an organisation should report to more than one superior on any single function. The more completely a subordinate has a reporting relationship to a single

superior, the less the problem of conflict in instructions and the greater the feeling of personal responsibility for results. (Massie, 1987).

This is common in the production line in Ghanaian mines where the foreman for instance, reports to a shiftboss, the shiftboss to a mine captain, the mine captain to a sectional underground manager, who in turn reports to an underground manager and finally, the underground manager reports to the general mines manager.

There are however, times when people by-pass line authority to achieve their objectives due to pressure. For example, a mine captain may exercise authority over a mechanic underground even though, the mechanic is not his subordinate.

The problem associated with these multiple command cannot be overemphasized but Koontz et. al., (1984), say that an obligation is essentially personal, and authority delegation by more than one person to an individual is likely to result in conflicts in both authority and responsibility. The principle is useful in the clarification of authority - responsibility relationships.

2.3.1.2. Span of control

The essence of this principle is that, there is a limit to the number of subordinates that one superior should supervise. The determination of the optimum number depends on underlying variables in a given organisation and should be tied directly to the question of the number of levels in the hierarchy. Smaller spans result in a greater number of levels, ("tall" structure) than larger spans of control, ("flat" structure).

Span of control focuses attention on the basic fact that any human being has limitations. These limitations include : availability of time, energy and the number of subordinates to

which a manager can give attention. These limitations also indicate that, the optimum span of control varies among individuals . Also, the span of control under one set of physical conditions will differ from the span under another set. (Koontz et. al., 1984). A supervisor in an underground mine for instance, faces different conditions from a supervisor in a surface mine.

Koontz et. al. (1984), state the following advantages and disadvantages about spans of control :

Narrow Spans

Advantages

i. Close supervision.

ii. Close control.

iii. Fast communication between subordinates and superiors.

Disadvantages

i. Supervisors tend to get too involved in subordinates' work.

ii. Many levels of management.

iii. High cost due to many levels.

iv. Excessive distance between lowest level and top level.

Wide Spans

Advantages

i. Supervisors are forced to delegate.

ii. Clear policies must be made.

iii. Subordinates must be carefully selected.

Disadvantages

i. Tendency of overloaded superiors to become decision bottlenecks.

ii. Danger of superior's loss of control.

iii. Requires exceptional quality of managers.

2.3.1.3. Span of Responsibility

It refers to the number of people whom one superior can assist, teach, and help to reach the objectives of their jobs - that is the number of subjects who have access to the superior. This could be larger than the span of control.

2.3.1.4. Scalar Principle or Chain of command

The scalar principle states that authority and responsibility should flow in a clear unbroken line from the highest executive to the lowest. It implies that an organisation is a hierarchy. The importance and usefulness of the principle is evident whenever the line is severed. The splintering of one organisation into two or more results from a permanent breach of this

principle (Massie, 1987).

In its simplest form, a chain of command is a relationship between a superior and subordinate, and could be seen as a series of lines connecting him with his subordinates. These subordinate managers, in turn, are connected with their subordinates. Each individual is connected to the chain of command at some point. (Longenecker, 1969).

This principle is clear in the authority relationships and information flow that prevail in the Ghanaian mines. Even though the scalar principle implies an authoritative relationship, three distinguishable characteristics are involved -namely, authority, responsibility and communication. Superiors issue orders and subordinates are held accountable for their performance.

2.3.2. Contingency theories of Organising

New approaches to organisational design have been developed to help the manager to make rational choices both in situations where classical concepts are relevant and in those where the participative theories are preferable. The contingency approach emphasises that a manager refrains from choosing one of the two universal theories on an all-or-nothing basis but to adopt certain ideas from both, to the situation. The approach has identified four groups of factors that matter in a manager's choice. (Massie, 1987). It states that there is no best way of doing things in management but that situations should dictate what actions to take.

1. The nature of people in the organisation.

2. The type of task and technology.

3.The environment in which the organisation operates, and

4. The degree of change and uncertainty faced by the organisation.

The organisational charts of the Ghanaian mines as mentioned earlier have had to be altered to meet particular situations or challenges. Prestea Goldfields Limited, some time past, had separate administrative and personnel managers, which they have now combined to create a new position - Chief of personnel and administration (COPA). Typically also, spans of control are wider in surface mines than the underground mines because of the more favourable working conditions.

2.3.3. Systems Approach

A system is a set of components that are related in the accomplishment of some purpose. A company, an agency, and a department are examples of a system. All systems, except perhaps that of the universe, interact with and are influenced by their environments, although we define boundaries for them so that we can see them more clearly and analyse them. (Koontz et. el, 1984). Systems are either "closed" or "open". A system is regarded as open if it exchanges information, energy or material with its environment as happens with social systems, for example a company. It is closed if it does not have such interactions with its environment. The open system approach is the approach adopted here.

The manager establishes those relationships among component parts that provide the most effective system. If he is successful, the result is a streamlined, efficient, smoothly functioning mechanism. (Longenecker, 1964).

There is the need to design the subsystems of a company - grouping activities into units, departments, and divisions, bearing in mind their interrelations.

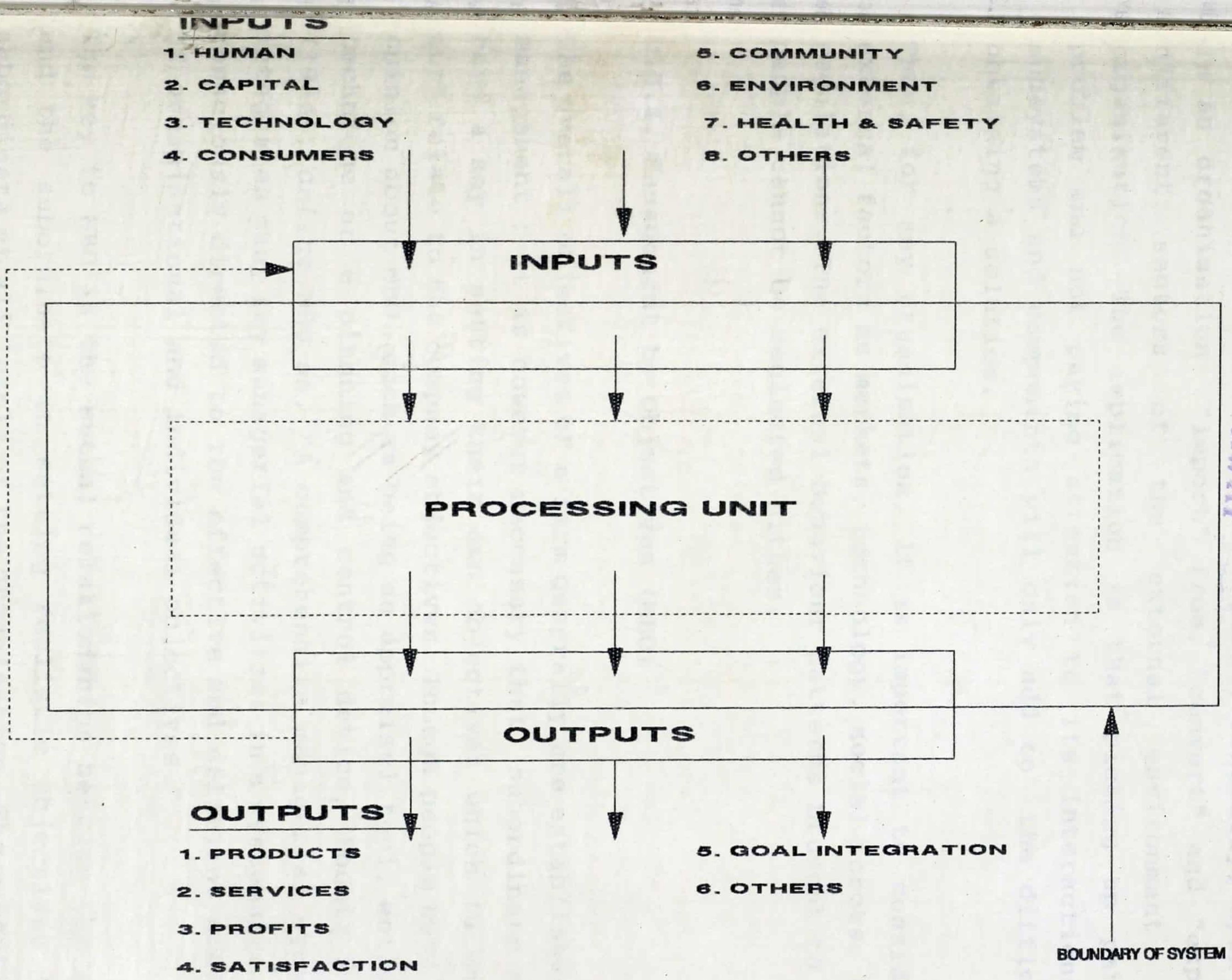


FIGURE 2

A simplified Systems Approach to management

Source : Adopted from Koontz et. al., Management (1984)

Due to the dynamic nature of every organisation, changes are bound to occur in the system resulting in the adaptations necessary in the subsystems of the company and in relationships among subsystems.

It requires the recognition that a formal organisation in our society operates as an interdependent series of open systems each of which imports, converts and exports. Generally, open systems in an organisation "import" from, "convert" and "export" to different sectors of the external environment of the organisation. The implication is that picking up part of a problem and not paying attention to its interactions among subsystems and components will only add to the difficulty in obtaining a solution.

Thus, for any organisation, it is important to consider such external factors as markets, technology, social forces, laws and regulations. The external behaviour patterns brought to jobs by people cannot be neglected either.

2.3.4. Management by Objectives (MBO)

The overall objectives of a firm generally are established by top management ; it is however necessary that, subordinate managers have a say in setting their own objectives which in any case, must relate to the company objectives. Though people have varying opinion about MBO, such as being an appraisal tool, motivational technique or a planning and control device, Koontz et. al., (1984), define MBO as, "A comprehensive managerial system that integrates many key managerial activities in a systematic manner, consciously directed to the effective and efficient achievement of organisational and individual objectives."

The key to MBO is the mutual relationships between the superior and the subordinate in setting realistic objectives for the subordinate at all levels of the organisation. The executive must

narrow the range of attention of each person to focus on definite and measurable meaningful results.

2.4. DECENTRALISATION

Organisation authority according to Koontz et. al., (1984), is the discretionary right to carry out assignments that is the power on people to use their judgement in making decisions. Whether authority should be concentrated or dispersed is a question not so much of what kind as of how much authority. Evidently, some decentralisation occurs in all organisations. Absolute decentralisation is non-existent or else managers would cease to remain in position after delegating all their authority, and there would be no organisation.

The practicality of decentralisation is seen in the number of levels and departments that exist in the mine organisations. Managers at these levels and departments are given enough authority to use their own discretion in making certain important decisions at their levels and departments.

Koontz et. al., (1984), state that decentralisation is greater:

1. The greater the number of decisions made lower down the management hierarchy.

2. The more important the decisions made lower down the management hierarchy. For example, the greater the sum of capital expenditure that can be approved by the plant manager without consulting anyone else, the greater the degree of decentralisation in this field.

3. The more functions affected by decisions made at lower levels. Thus companies which permit only operational decisions to be made at separate branch plants are less decentralised than those which also permit financial and personnel decisions at

branch plants.

4. The less checking required on a decision. Decentralisation is greater when no check at all must be made; less, when superiors have to be informed of the decision after it has been made ; still less if the superiors have to be consulted before the decision is made. The fewer people to be consulted and the lower they are on the managerial hierarchy, the greater the degree of decentralisation.

Even though decentralisation is closely related to delegation of authority, its implications are more : It reflects a philosophy of organising and managing. It requires careful choice of what decisions to push down into the organisation structure and to hold at or near the top, specific policy making to guide the decision making, selection and training of people and adequate controls. Decentralisation as stated earlier, affects all areas of management and can be looked upon as an essential element of managerial system. Without it, managers could not use their discretion to meet the ever-present and ever-changing situations they face. Decentralisation is an essential ingredient in creating organisational structures.

2.4.1. Delegation of Authority

No one manager can bear all the responsibilities of management and it is literally impossible both physically and legally, in the case of a shift boss for instance to supervise all the activities of a multi-section mine at the same time, (drilling, blasting, cleaning, submitting daily reports, etc.).

Britton (1983), says that, when the scope of management responsibilities become too much for a manager, he will delegate portions to other individuals. This allows more work to be done and increase the number of tasks accomplished. A headway in delegating authority is however made, when the manager perceives

a need for better direction of tasks he cannot personally direct.

2.5. Ideal Structure

The desirable structure is the one that will be most effective in accomplishing company objectives. It represents the theoretically desirable structure for the particular organisation. It would be drawn naturally, in terms of the specific objectives and purposes of the organisation. It does not also take into account the human or other limitations of the particular organisation.

In trying to develop the most suitable structure, the following fundamental principles by Allen (1973), may be considered :

2.5.1. Principle of Objective

We can do meaningful work only if we know its purpose. Organisation productivity increases as the work performed is directed toward tangible, understood, and accepted objectives.

2.5.2. Principle of Specialisation

People specialise by concentrating their energies on one specific area or job. The more specialised the work assigned to individuals within the limits of human tolerance, the greater the potential for efficient performance.

The limit of human tolerance is reached when the work becomes so routine and narrow that the individual finds it mechanical. This limit varies with the individual.

2.5.3. Principle of Logical Arrangement

When work is arranged on a logical basis, with the structure designed to accomplish objectives, there is a rational basis for change. Each job is assigned as much responsibility and authority as the position can reasonably carry. In this way, the aggressive person is prevented from encroaching on other jobs.Logical arrangement of work is the only way to prevent overlap, duplication, and friction in the long term.

2.5.4. Principle of Maximum Span

The more people each manager can effectively manage, the smaller the total number (managers) the organisation will require to attain its objectives.

2.5.5. Principle of minimum levels

The span of supervision is directly related to the number of organisational levels. The fewer the levels of supervision within the limits of maximum span, the greater the potential effectiveness of the people involved.

The number of levels of supervision should be kept to a minimum to prevent line loss, organisational slip and added cost. As a generalisation, the greater the number of organisational levels, the more communication between top and lower levels is weakened, distorted and diffused.

The ideal structure would serve as a standard and provide a goal toward which the organisation is expected to move and also a standard by which an existing structure may be evaluated. This is sometimes pictured as a kind of long-term plan toward which the company aspires. In view of the Ghanaian environment, figures 9.1, 10.1, 11.1, and 12.1, ~~are~~ proposed.

2.6. Modification of the Ideal Structure

Because an organisation structure must function in a real world, the organisation planner must appreciate limitations in the creation of that structure. Consider departments that are necessary and absent, for example, industrial engineering, and that for the environment, in some of the Ghanaian mines. Their current importance calls for their incorporation into the organisational systems of the mines. This also calls for necessary concessions at specific spots, based on the financial or human limitations.

Modifications of an ideal structure may be viewed as a temporary measure. Time often solves organisational problems. Some managers retire, and others develop their abilities with the passage of time. As the years pass, then, the organisation may be brought more closely into line with the structure that has been devised to function most efficiently (Justin, 1983).

CHAPTER THREE

EXISTING ORGANISATIONAL STRUCTURES IN THE GHANAIAN MINES

3.1. GENERAL INFORMATION

Ghana is quite rich in mineral resources. Gold, bauxite, manganese and diamonds are some of the minerals that exist and are being mined. The mines are located in the tropical rain forest, (southern sector) of the country. Mining of these minerals is either by underground or surface means.

They are either classified as large or small with labour employment in the range of three hundred to ten thousand people. As mentioned earlier, the organisational structures differ from one another in terms of function, spans of control, levels in the hierarchy etc due to such reasons as size,type of mine, (underground or surface) and complexity.

Generally, the mines are organised by function ; production, accounting, processing, administration, technical services, etc. (See Figure 1). Even though, allowances are made for health and safety and environmental issues, there is hardly any organised department for them. Training departments exist only in some of the mines, especially the old ones.

Line and staff authority relations are common in all the mines, with instructions flowing from superiors to subordinates. Functional authority also exist. This is seen clearly in the authority exercised by the engineering department over equipment being used by the production department (mining), and the processing department in particular because they use many equipment in their operations.

With the exception of A.G.C., (Ghana) limited, that has five general managers, a typical feature characteristic of the Ghanaian mines is that of a board of directors, a managing director or chief executive and one general manager, in descending order of authority and importance when it comes to decision making on the mine. The organisational hierarchy in the Ghanaian mines has been considered in three main levels of management : top, middle and lower levels. Top level management refers to the general manager position and above, middle level refers to heads of departments, while the lower level covers the front line supervisors.

The general managers (upper level managers), have spans of control ranging from four to eight, depending on the type of mine, size and complexity. At the middle level of management, spans range from one to six, while for lower levels, we have a minimum of three subordinates. This is in contrast to the organisational structure theory that, the higher one is in the hierarchy, the lower the number of subordinates that have to report to him/her. That is, the shiftboss should have more subordinates than the mine captain, who should in turn have more subordinates than the underground manager, etc. Compared with the underground mines, surface mines have wider spans of control and fewer levels in their organisations resulting in flat and tall structures respectively. They are also less labour intensive.

The organisational structures also reveal different number of levels in the hierarchy ranging from five to eight.
Decentralisation and delegation of authority, though common to all the mines, vary in degree on individual mines. Though, the mines intend to have suitable structures, a clear look at the organisations still show lapses, overlaps and abnormalities in some of them. In this case, there is lack of clarity and conflicts of roles in such areas.

TABLE 1 : SUMMARY OF SPANS OF CONTROL IN EXISTING MINES

		SPAN OF CONTROL		
MINE	LEVELS IN THE HIERARCHY	TOP LEVEL MANAGEMENT	MIDDLE LEVEL MANAGEMENT	LOWER LEVEL MANAGEMENT
AGC	7	4-5	4-7	6 OR More
PGL	5	9	6	3-6
GNMC	8	10	2-5	3-5
GAG	5	5	3-6	1-10

TABLE 2 : SUMMARY OF SPANS OF CONTROL IN PROPOSED STRUCTURES

		SPAN OF CONTROL		
MINE	LEVELS IN THE HIERARCHY	TOP LEVEL MANAGEMENT	MIDDLE LEVEL MANAGEMENT	LOWER LEVEL MANAGEMENT
LARGE SURFACE	4	7	2-4	4-10
SMALL SURFACE	4	6	2-3	2-10
LARGE UNDERGROUND	4	7	3-4	4-12
SMALL UNDERGROUND	4	7	2-4	3-12

3.2. ASHANTI GOLDFIELDS CORPORATION

Ashanti Goldfields Corporation (A.G.C) of Ghana limited is currently the largest and most progressive mine in the country. It is found in Obuasi, near Kumasi in the Ashanti region of Ghana. It has a labour force of about ten thousand people.

An expanding mine like this, needs organisational structural changes to yield the maximum output. In view of this, the author had to conduct an interview at various levels of management to determine the realities existing or present on the mine.

A.G.C., is jointly owned by the Ghana government (55% shares) and Lonrho (45% shares). It has about ten shafts with eight of them in operation. It also has a surface mine at Sansu. The labour force is made up of both Ghanaians and expatriates, the former constituting the larger number. Human and interdepartmental relations on the mine are quite cordial and thus communication is quite good on the mine.

Workers on the mine enjoy such facilities as accommodation, medical attention and good salary. The corporation allows room for personal development, renumerations and conducts salary surveys in other industries so as to be able to retain their working staff.

The main objective of A.G.C is to maximise profits and this, the corporation has always achieved by meeting or even sometimes exceeding its targets.

3.2.1. The Organisational Structure

The organisational structure of A.G.C has undergone changes in recent times. This was considered to depend on technology, objectives, recruitment policies, the principle of delegation, and size of company.

As opposed to a few years ago, when A.G.C had only one general manager, she now has as many as five ; the general managers for Sansu mine (surface), Obuasi mine (underground), Ashanti Mine Expansion Project, Corporate Services and Finance. The reasons may be due to the expansion on the mine, technology and several differing functions for the managers. These necessitated the creation of the five general managers.

First, there is the need to separate the surface and underground mines, finance also has become very complicated, there is the expansion going on which needs a separate general manager and corporate services also need a general manager.

A study of the organisation chart, figure 3.1, shows a managing director as the most superior with the co-ordinating general manager as an immediate subordinate. The co-ordinating general manager has five subordinates who in turn have spans ranging from four to five. Seven levels exist in the hierarchy with differing spans of control. At the top level, this is roughly 3-5, 7 at the middle and 6 or more at the lower levels.

Some of the departments on the mine include :

i. Mining

ii. Processing or milling

iii. Human Resources

iv. Public relations

v. Industrial engineering

vi. Training

vii. Finance

viii. Special Services (security) and,

ix. Medical Services

3.3. PRESTEA GOLDFIELDS LIMITED (P.G.L)

Prestea Goldfields Limited belongs to the Ghana government and currently has three operating shafts. The mine has a work force of two thousand one hundred and fifty people, that is excluding casuals who number one hundred and fifty three. A detailed information is as shown in P.G.L., general information as in Appendix 1.

The monthly target depending on budgets and resources (inputs e.g locomotives, drills, lamps, boots, mill liners, etc) is one thousand eight hundred and eighty ounces fine gold. Two thousand five hundred ounces is possible. However, there has not been constant increases in the production due to capitalisation problems, ageing of equipment, lack of exploration and development, etc.

3.3.1. The Organisational Structure

P.G.L, has also undergone changes over the years based on functions and responsibility. The mine has one General Manager(G.M) with nine subordinates.

Details of the organisational structures are as shown in the Figure 4.1, Figure 4.2 and Appendix 1. Five levels exist in the organisational hierarchy with every manager apart from his operational activities, playing an advisory role. On the average, the span of control for the top level management is nine, middle level, 6 and at the lower levels, 3.

Departments that exist on the mine include :

i. Mining.

ii. Technical services.

iii. Administration and Personnel

iv. Engineering

v. Processing or Milling

vi. Medical Services

vii. Exploration

viii. Accounting

3.4. GHANA NATIONAL MANGANESE CORPORATION (G.N.M.C.)

The important known deposit of manganese and, the only producing manganese mine in Ghana, G.N.M.C., is at Nsuta, where high quality manganese dioxide has been mined since June 1916. The manganese deposits are located on five hills in the area.

3.4.1. The Organisational Structure

Like the other mines, Ghana National Manganese Corporation, has been organised by function. The mine has a board of directors, a managing director, deputy managing director and a general manager forming the top level management.

The general manager has as many as ten subordinates. Details of the organisation structure are as shown in the organisation chart, Figure 5.1. From the gangmen to the general manager, eight

levels exist. At the middle level of management, spans of control lie between two and five, and between five and six at the lower levels.

Some of the departments on the mine are:

i. Mining

ii. Technical and Planning

iii. Engineering

iv. Administration

v. Accounting

vi. Processing

vii. Security

3.5. GHANAIAN AUSTRALIAN GOLDFIELDS LIMITED (G.A.G.)

The Iduapriem Gold Mine (G.A.G.), is located in the Western Region of Ghana some seventy kilometres north of the coastal city of Takoradi, and ten kilometres southwest of Tarkwa. G.A.G., is one of the new mines. Its first ore was mined in May 1992 and first gold poured in September the same year.

The mine is owned 100% by Ghanaian Australian Goldfields limited. G.A.G., a Ghanaian company owned by Golden Shamrock Mines, (GSM) (68.95%), International Finance Corporation (I.F.C.) (20%), Government of Ghana (10%), and minor shareholders (1.05%).

The basic objective of G.A.G., is maximisation of profits and enhancement of long term strength of the company. Its targeted

At present, the mine has a labour force of two hundred and eighty employees.

3.5.1. The Organisational Structure

The mine has one general manager with six direct subordinates, who in turn have three to six direct subordinates. See Figure 6.1. In all, five levels exist in the organisational hierarchy ; the general manager, heads of departments, supervisors, foremen and operators/labourers/technicians, in descending order of authority. Supervisors and above, are involved in both line and advisory relations.

Essentially, organisation is by function . Departments at G.A.G., include :

i. Technical services

ii. Mining

iii. Treatment

iv. Finance and administration

v. Supply.

3.6 TEBEREBIE GOLDFIELDS LIMITED

The Teberebie mine is situated 5 km south of Tarkwa in the Western Region of Ghana. It has a 25 km^2 mining concession. Though this was acquired in 1988, actual mining began in May, 1989 with an annual nominal production capacity of 65,000 ounces. This has been raised to 100,000 ounces per year. Teberebie got its first gold in October, 1990.

The mine is jointly owned by The Pioneer Group, Inc., Boston, Massachusetts, U.S.A. and the Republic of Ghana. The former has a 90% interest and the latter 10% interest in the mine. The main objective of the mine is to maximise profits.

3.6.1 The Organisational Structure

The mine has one general manager with ten direct subordinates, who in turn have two to four subordinates. The number of levels between the general manager and the frontline supervisors is three - General manager, heads of departments and the frontline supervisors.

The mine is structured by function. Departments in the mine as shown in its organisation structure (Figure 7.1.) include :

i. Mining

ii. Processing

iii. Finance

iv. Exploration

v. Geology

vi. Security

vii. Medical

viii. Operations

3.7 BILLITON BOGOSU GOLD LIMITED (B.B.G)

The Billiton Bogosu Gold concession (150 km^2) is located north

and south of Bogosu in the Western Region of Ghana. It is about 125 km by road north of Takoradi. Denison Mining Ltd. of Canada acquired and was awarded the Bogosu concession in 1986. Denison made a joint venture agreement in the same year with Sikaman Gold Resources Ltd. of Canada to evaluate and develop the Bogoso concession, Canada Bogosu Resources (C.B.R). Sikaman however sold her share to Billiton giving rise to a new name Billiton Bogosu Gold.

Billiton Bogosu Gold is owned jointly by Billiton 74%, International Finance Company of Canada 16% and the Government of Ghana 10% (Minproc Engineers, 1988)

3.7.1 The Organisational Structure

B.B.G., has a labour strength of nine hundred employees and organisation is by function. Like most of the mines in Ghana, it has one general manager with seven direct subordinates, see Figure 8.1., who on the average have ten subordinates. Three levels exist in the organisational hierarchy. Line and staff relations exist on the mine.

Departments in the mine include :

i. Mining

ii. Corporate Affairs

iii. Administration

iv. Finance

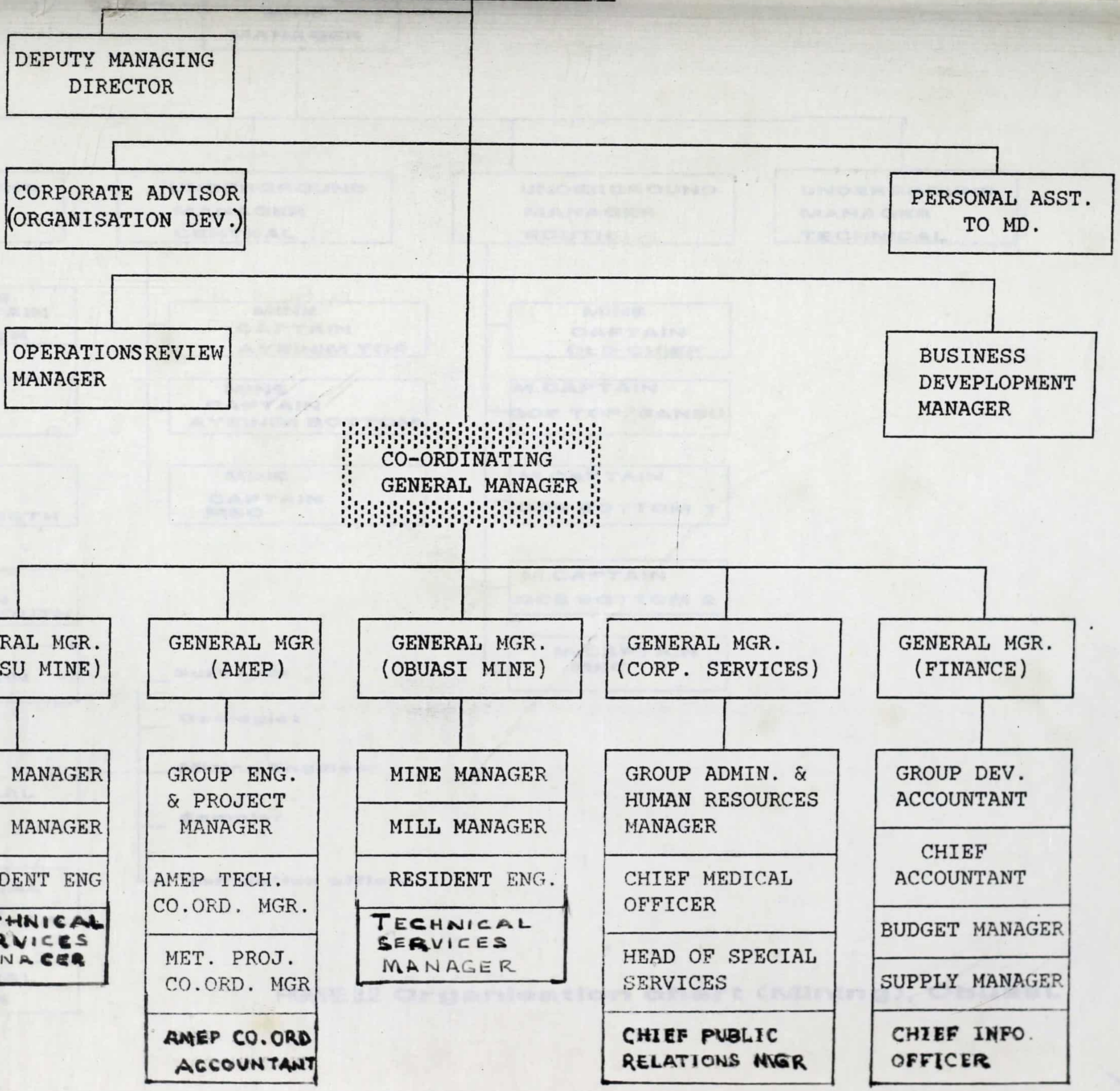
v. Engineering

vi. Security

vii. Materials

viii. Medical

ix. Environmental Safety and Health



GURE 3.1.

LIBRARY
UNIVERSITY OF SCIENCE AND TECHNOLOGY

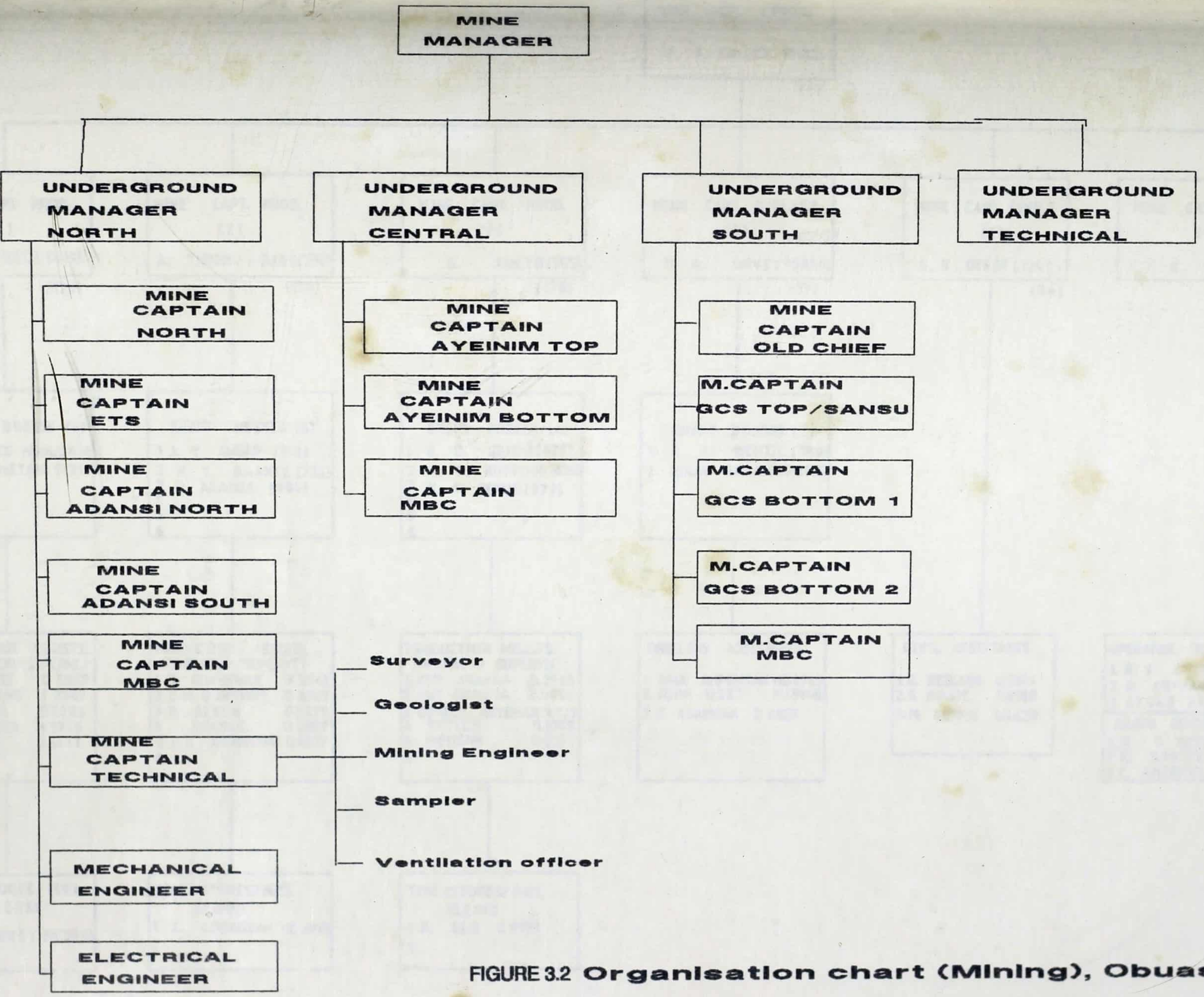


FIGURE 3.2 **Organisation chart (Mining), Obuasi.**

MINE SUPT. (PROD.)
I. A. KALEEM (0412)
(1)

NE CAPT. PROD.
(2)
K. PAINSTIL (411)
(170)

SHIFT BOSSES (6)
J. GARTEY MOULD 826
E. AMETAM (943)

PRODUCTION ASSISTS. (OPERATOR SUPERVI.)
KOUFFIE D 5958
L. K. MANU J 2501
KRAMPA D 2786
ALEXANDER H 5915
AFFUL D 6111

IME / STORES / FUEL CLERKS
P. YANKEY MC 5533

MINE CAPT. PROD.
(2)
A. TAMIMU - DARI (736)
(170)

SHIFT BOSSES (6)
1 J. Y. AWUAH (942)
2 F. Y. BAANYE (776)
3 R. AKABOA (984)
4
5
6

PRODUCTION ASSISTS. (OPERATOR SUPERVI.)
1 D. ADARKWAH D 5961
2 E. M. DORNYOH D 6189
3 F. ACKON D 3479
4 BOAMAH D 5889
5 J K AMPONSAH D 6172
6

TIME / STORES / FUEL CLERKS
1 J. ABRAQUAH MC 5913
2

MINE CAPT. PROD.
(2)
B. AHETO (355)
(170)

SHIFT BOSSES (6)
1 B. D. SEIDU (629)
2 K. T. KUFFOUR (830)
3 K. T. ODUM (977)
4
5
6

PRODUCTION ASSISTS (OPERATOR SUPERVI)
1. BEN ANAMAN D. 2565
2 AWI DAKOTA D. 5976
3 OPOKU AGYEMAN 4777
4 TETTEH D. 5998
5 MENSAH D. 5955
6

TIME / STORES / FUEL CLERKS
1 R. LEO C 8197
2

MINE CAPT. D/BLAST
(1)
M. A. DAVEY (5030)
(53)

SHIFT BOSSES (2)
1 K. A. BENTIL (740)
2 ISAAC ANSAH (MA8965)

DRILLING ASSISTANTS
1. PAUL AMPONSAH MD 8965
2. JOHN OSEI MJ 5148
3. S. ASAMOAH D 6855

MINE CAPT. CIVILS
(1)
S. K. GYEBI (724)
(34)

CIVIL ASSISTANTS
1 R. BEDIAKO D 5906
2 S. MASIE D 6188
3 M. COFFIE H 4628

MINE CAPT. SERV.
(1)
F. K. VERIGH (739)
(6)

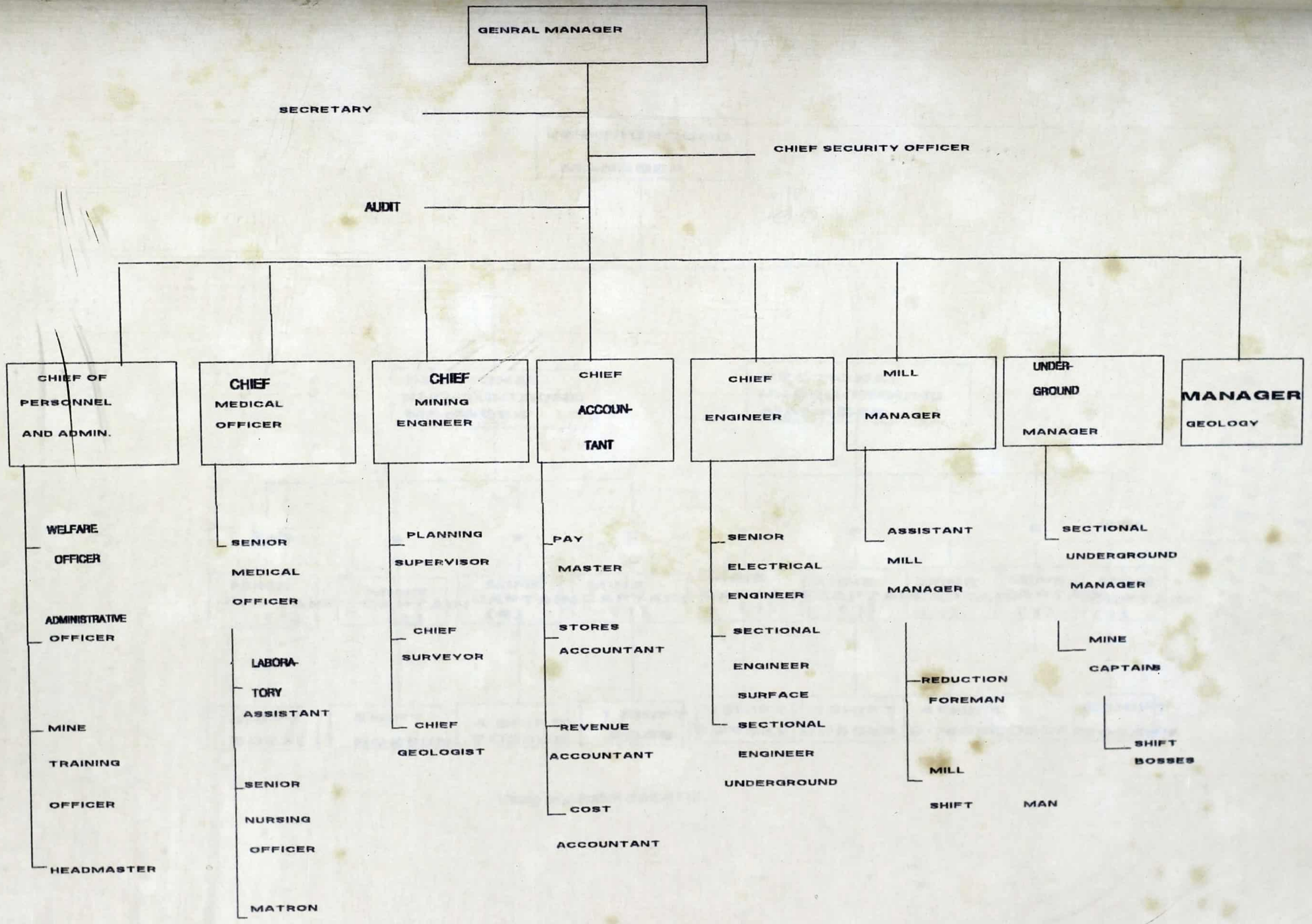
OPERATOR INSTRUCTORS
1. B. Y. OFORI D 5908
2. R. AGYMANG D 6113
3. ASARE BAAH D 5917

RADIO CONTROL OPER.
1. P. O. APPIAH MD 6662
2 K. DANIEL MD 5902
3 C. AHINFUL MD 5901

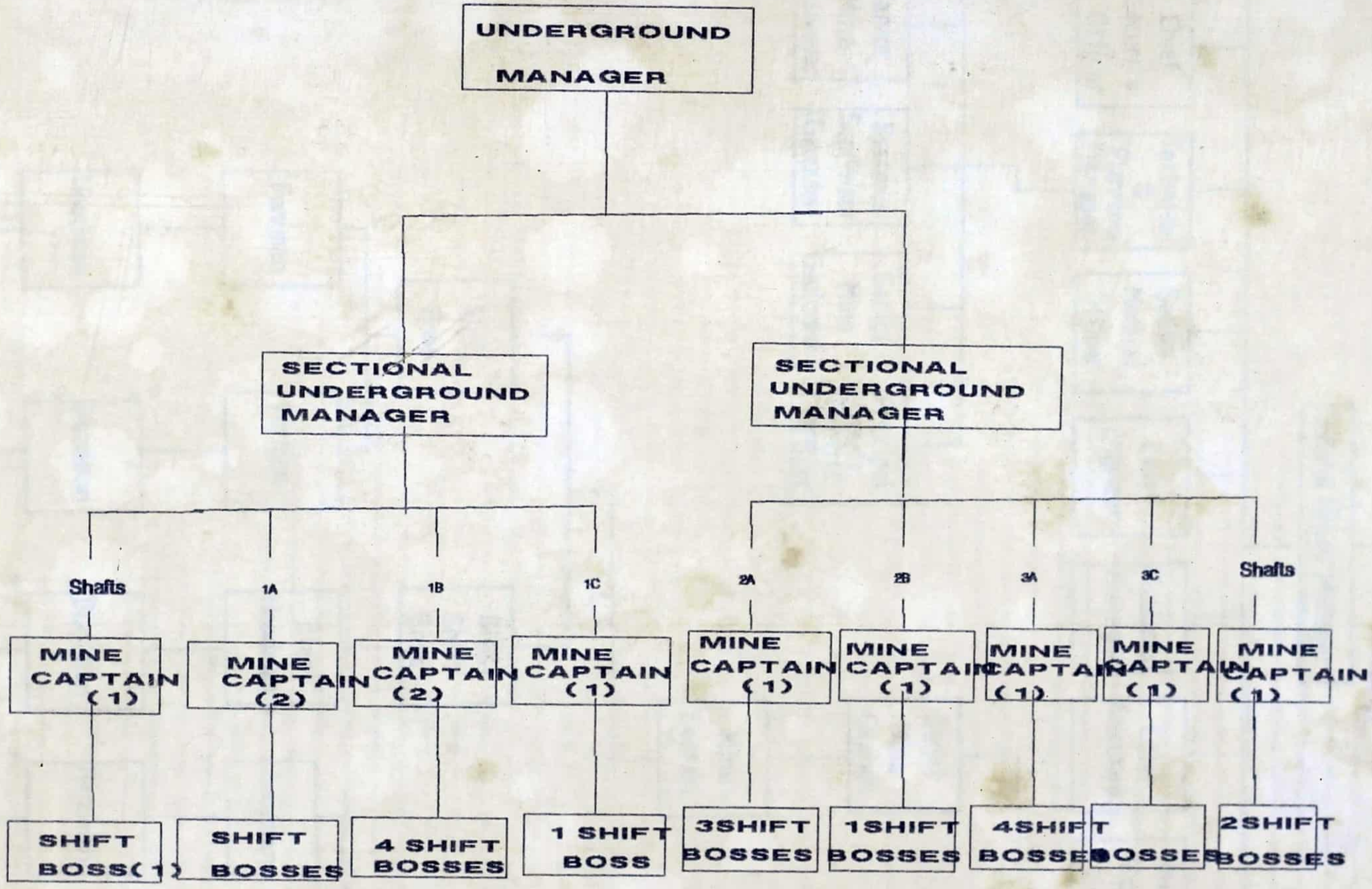
MINE CAPT. SERV.
(1)
P. W. ANAMAN (941)
(2)

PUMP SERVICE MEN
1. VACANT
2.

FIGURE 3.2.



ORGANISATIONAL STRUCTURE OF PRESTEA GOLDFIELDS LIMITED (PGL)



Mining organisation chart at PGL

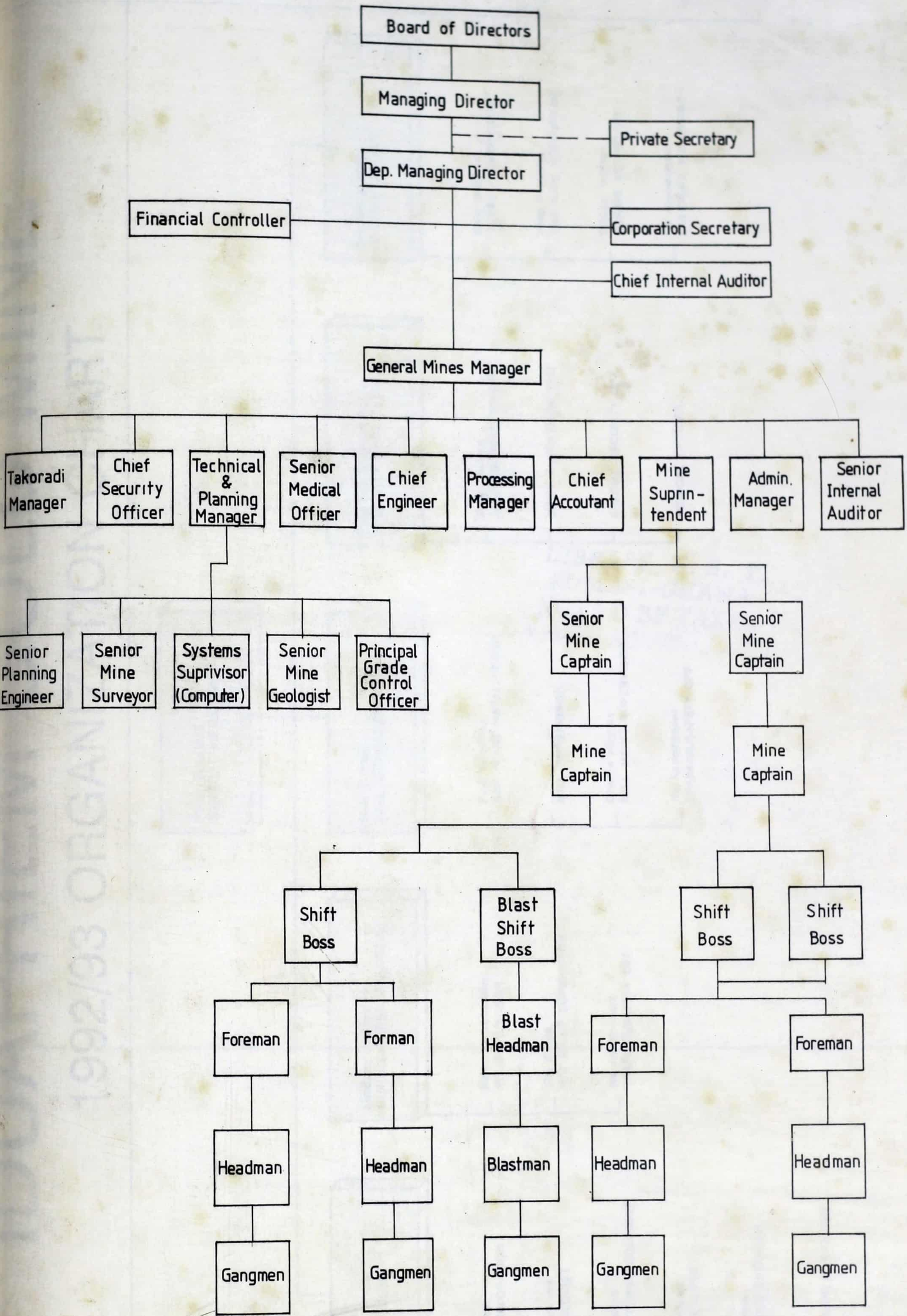
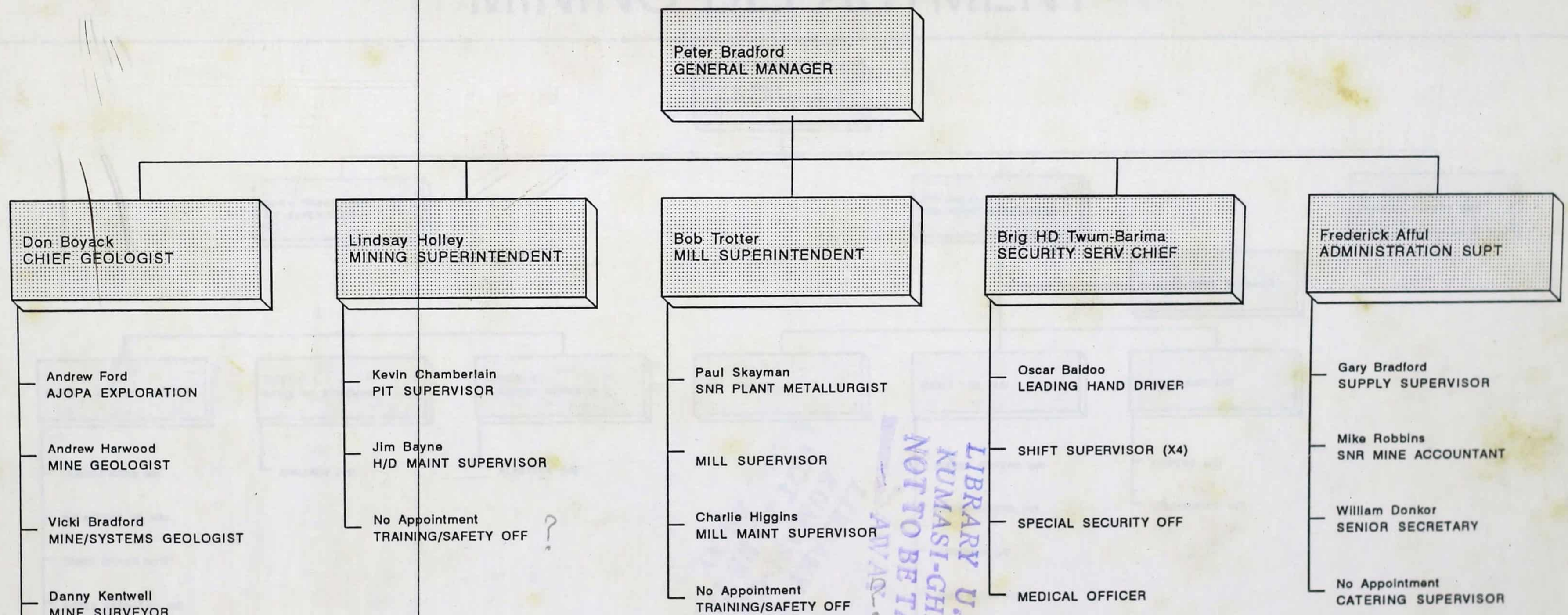


FIGURE 5.1 ORGANIZATIONAL STRUCTURE OF GHANA NATIONAL MANGANESE CORPORATION—AN OPEN-PIT MINE.

IDUAPRIEM GOLD MINE

1992/93 ORGANIZATION CHART



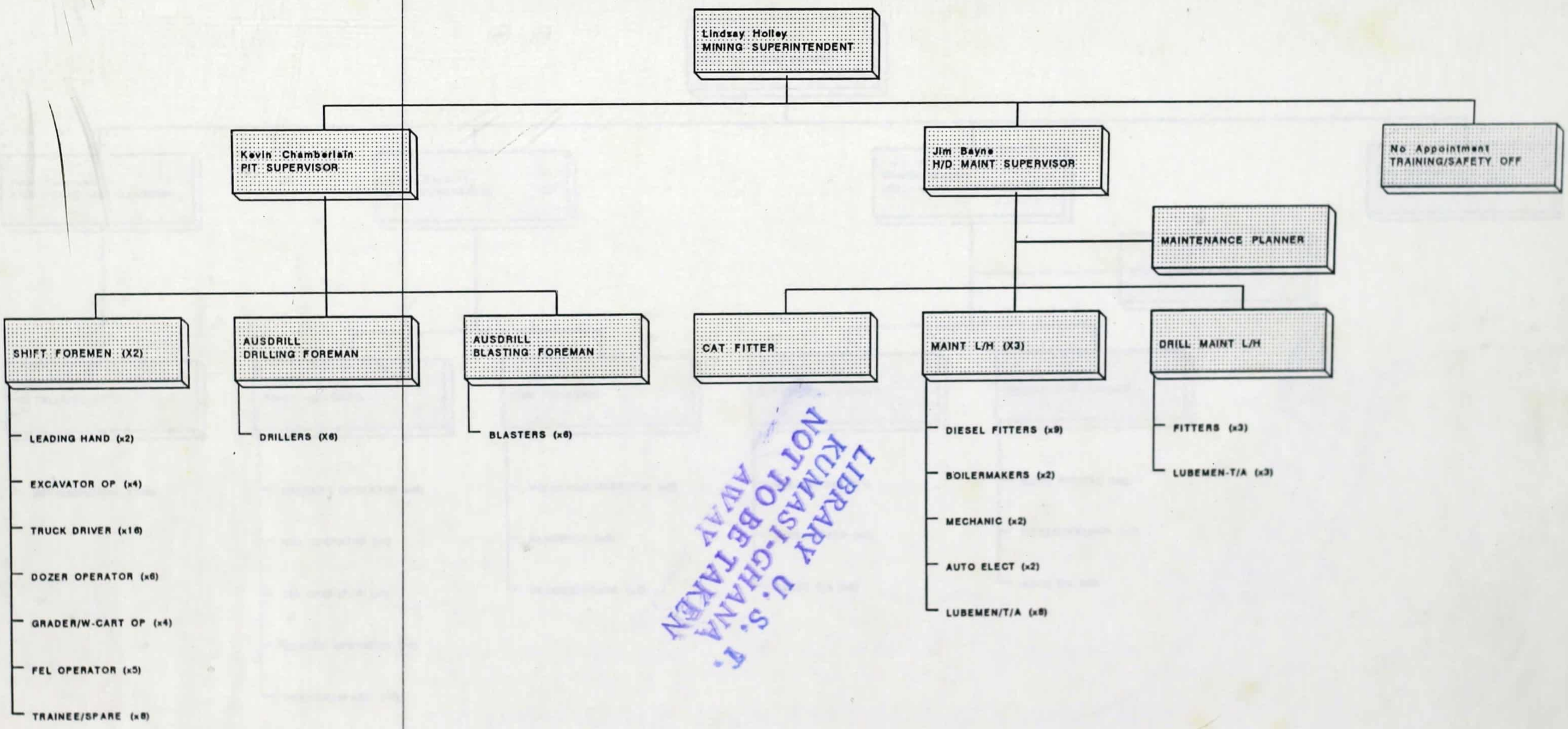
8th June, 1992

FIGURE 6.1.

IDUAPRIEM GOLD MINE

1992/93 ORGANIZATION CHART

MINING DEPARTMENT



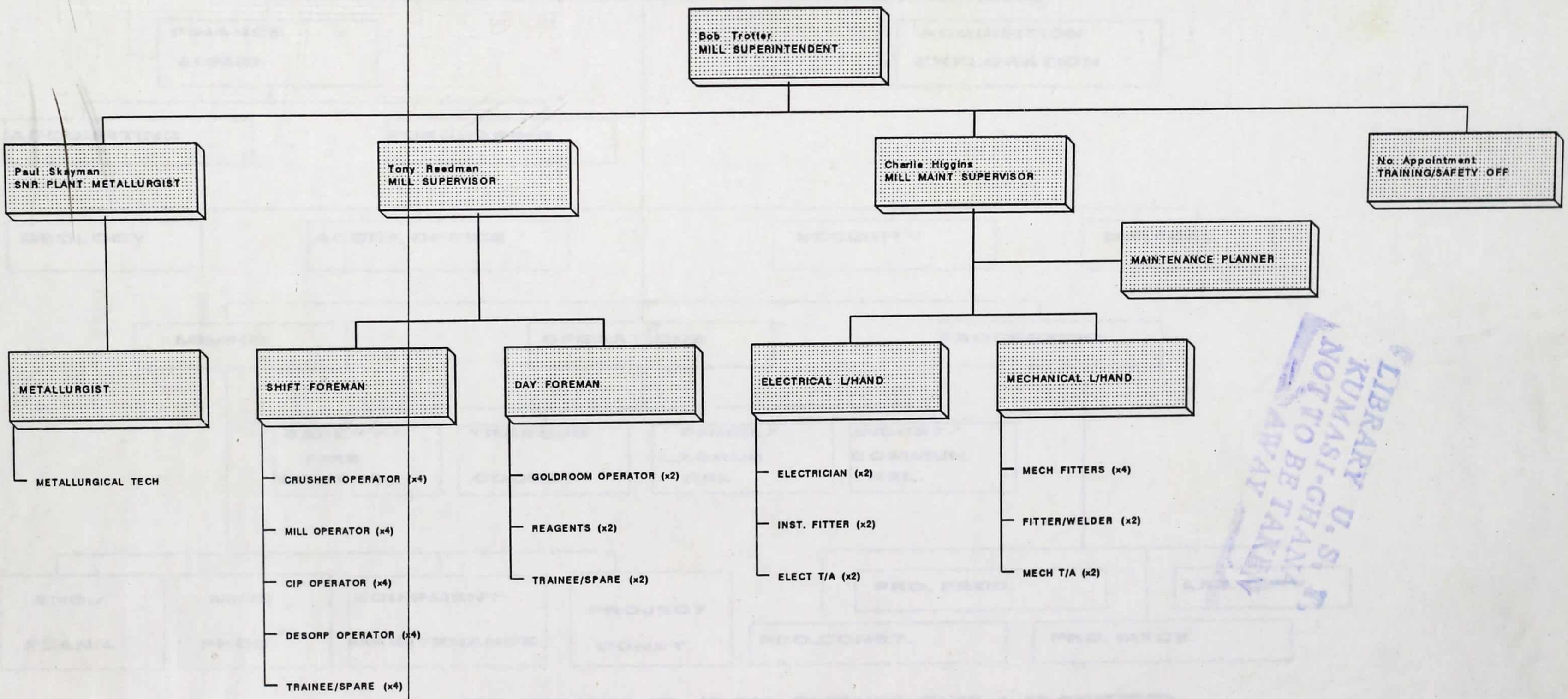
8th June, 1992

otal Employees = 100

FIGURE 6.2.

IDUAPRIEM GOLD MINE

1992/93 ORGANIZATION CHART
TREATMENT DEPARTMENT

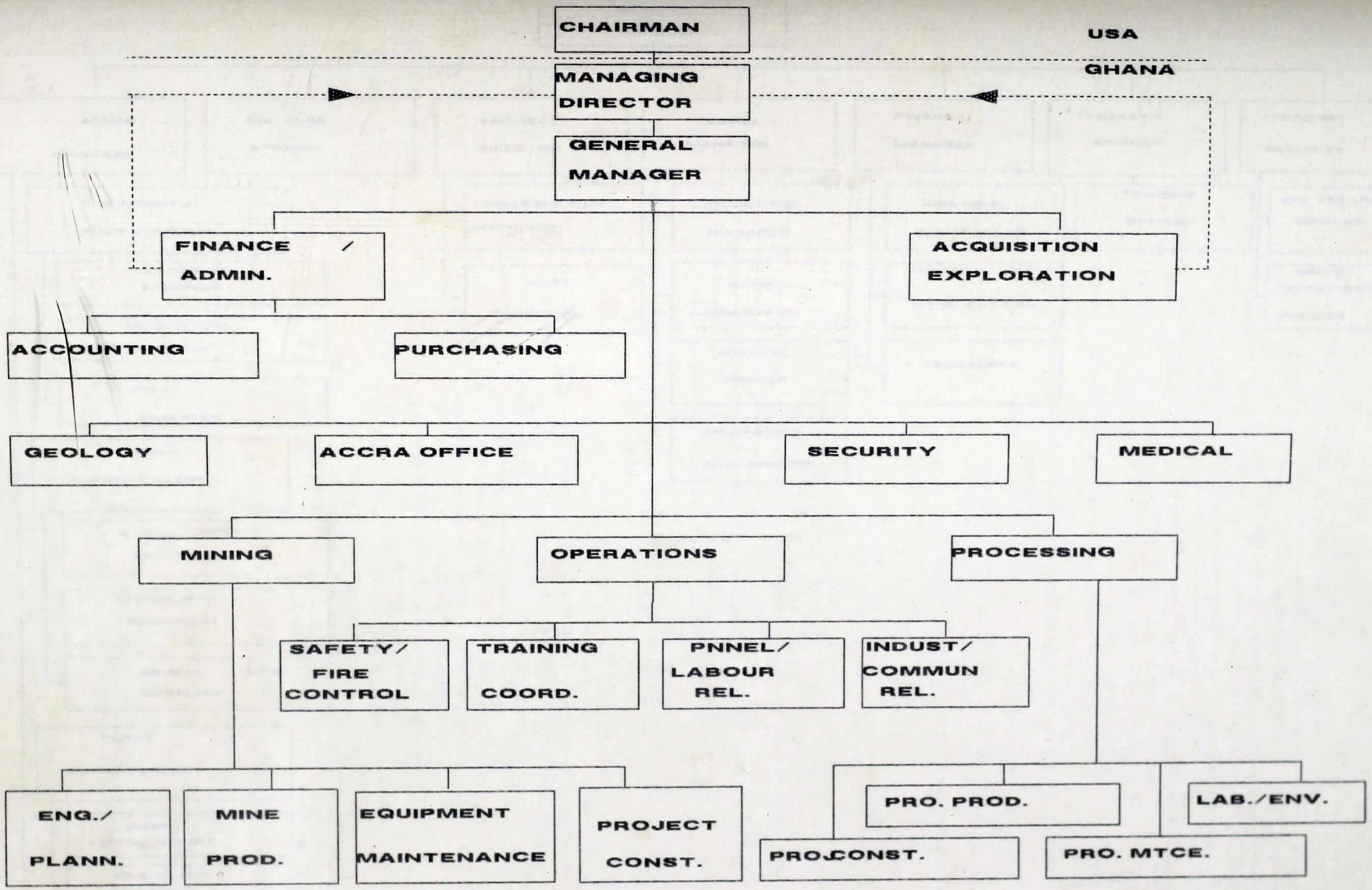


8th June, 1992

Total Employees = 55

FIGURE 6.3.

ORGANIZATION CHART



TEBEREBIE GOLDFIELDS LIMITED
DEPARTMENTAL ORGANIZATION (1993)

Figure 7.1

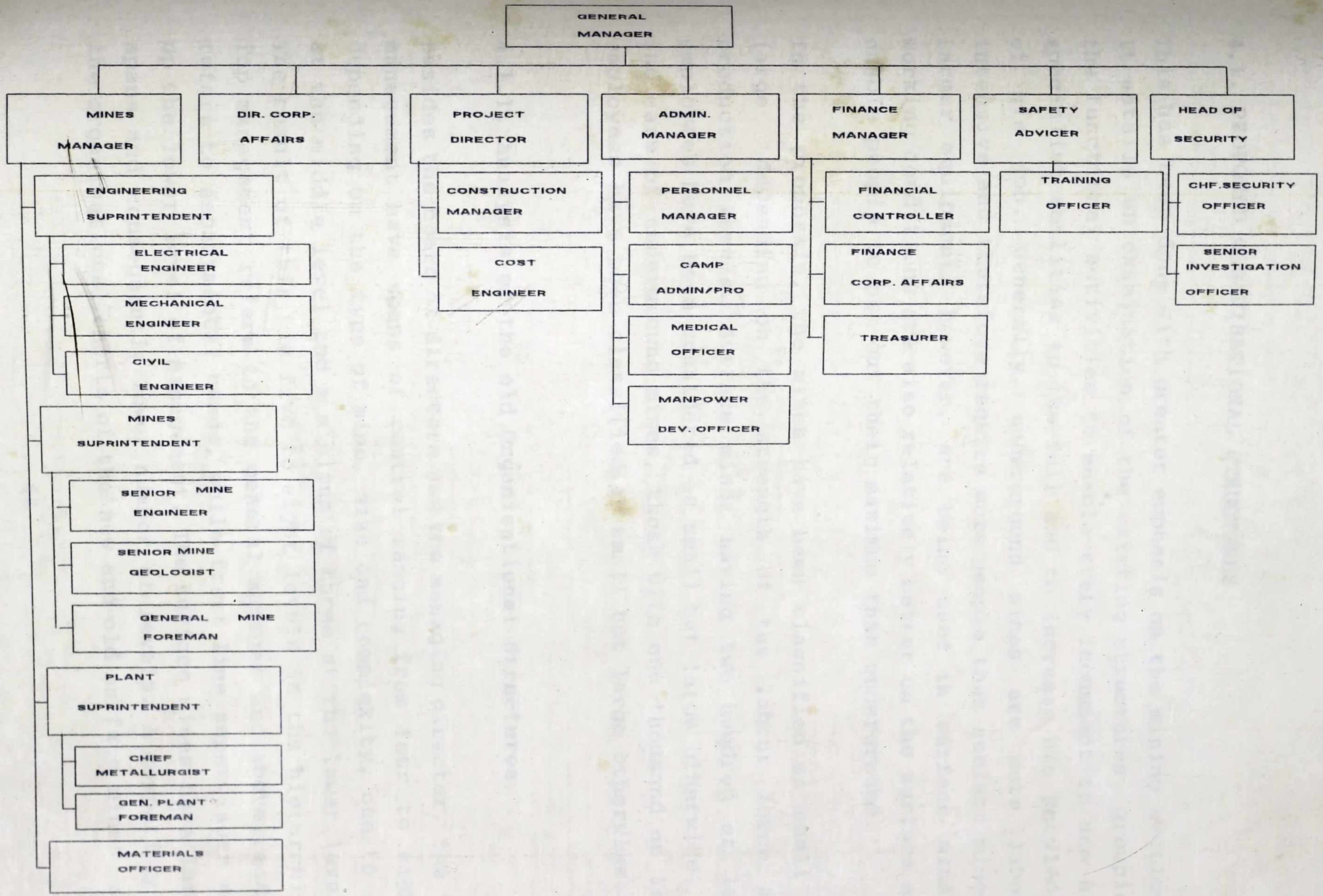


FIGURE 7. ORGANISATION STRUCTURE AT BILLITON BOGOSU GOLD

CHAPTER FOUR

PROPOSED ORGANISATIONAL STRUCTURES AND DISCUSSIONS

4.1. PROPOSED ORGANISATIONAL STRUCTURES

This has been done with greater emphasis on the mining section. It entails an examination of the existing structures, grouping the functional activities to enable every incumbent to use his specialist abilities to the full and to increase his knowledge of his job. Generally, underground mines are more labour intensive and therefore require more people than surface mines. Larger equipment, however, are being used in surface mines. Working conditions are also relatively better on the surface and enable people to put out their maximum than underground.

In the proposals, the mines have been classified as small or large depending on the strength of the labour force and production levels. Surface mines having two hundred or less employees have been considered as small but large otherwise. In the case of underground mines, those with one thousand or less employees have been classified as small but large otherwise.

4.1.1. Analysis of the old Organisational Structures

Besides the board of directors and the managing director, the top management have spans of control ranging from four to eight, depending on the type of mine, size and complexity, one to six at the middle level and a minimum of three at the lower levels. The result of this, is five to eight levels in the hierarchies. Top management refers to the general manager and above, middle refers to departmental heads, while front line supervisors make up the lower level of management. The surface mines have larger spans and consequently lower number of levels. A comparison of the organisational charts of the new and old surface mines, show

that, many more subordinates report to the general manager, (ten in the case of Ghana National Manganese Corporation), than the new mines, Ghana Australian Gold and Billiton Bogosu Gold where the subordinates are five and seven respectively. Many more levels also occur in the production line of the old mines.

Departmentation is basically by function in the old mines. Decentralisation is also common. This is clear in the levels and departments that exist.

A general overview of the structures, reveal the lack of departments for environmental issues and geotechnical services. Where these occur, the proper and needed attention is not given them.

4.1.2. New Developments

Alterations and modifications have been applied to the existing structures based on some new developments to obtain the proposed ones. Even though, many decision areas exist for which the mines function, only those that demand more emphasis or importance currently would be discussed. These contemporary issues include:

a. Environmental Issues

b. Geotechnical Services

c. Health and Safety

d. Public relations

e. Training

f. Marketing

g. Systems Analyses (Computer)

h. Duplications

i. Overlaps

The open systems approach is being called into play here. Items a - g will enter the system from outside and items h and i, will go out of the system.

4.1.2.1. Environmental Issues

Health hazards such as diseases of the skin and silicosis sometimes result from environmental pollution from the mines. In view of the high environmental degradation, such as water, air and dust pollution, landscape destruction, etc associated with mining, and its attendant problems with the community, it is most appropriate for all the mines to develop environmental management plans to ensure that, the construction and mining activities minimise any disturbance to the local environment. This also means, paying more attention to the environment than presently exist on some mines.

P.N.D.C.L. 153, Minerals and Mining Law, 1986, Part XI, Section 72, states that "The holder of a mineral right shall in the exercise of his rights under the licence or lease have due regard to the effect of the mineral operations on the environment and shall take such steps as may be necessary to prevent pollution of the environment as a result of such mineral operations ".

Environmental action plans therefore need to be reviewed often and upgraded to meet the standards of the community and guidelines of the laws of Ghana.

4.1.2.2. Geotechnical Services

As mining activities or operations increase, both in underground and surface, rock stability problems affecting the mines and possibly nearby areas may show up. The underground mines are going deeper and deeper. Rock stability is becoming a problem as cut-and-fill methods, square set and other supporting methods are increasingly being used. In the surface mines, slope stability is also increasingly becoming a problem. A careful study from experts of the rock and soil formations to monitor mining activities is necessary to prevent any failures, eventualities and protect the surface as stated in mining regulations, 1970, Part 5-40. The implication of this, is the creation of a well equipped rock and soil department with competent personnel to manage it.

4.1.2.3. Health and Safety

Due to the numerous cases of unsafe working conditions, accidents, health hazards resulting in huge sums of compensations, etc, there is the need to set departments solely in charge of health and safety. Introduction of new technology and equipment are creating safety problems also.

The mining regulations concerning the above subject stress the implied needed attention. Health and Safety should be incorporated into the daily operation of our mines.

P.N.D.C.L. 153, Minerals and Mining Law, 1986, Part XI, Section 82, Subsection 2, has it that, "The holder of a mineral right shall, in all phases of his operations, give preference in employment to citizens of Ghana to the maximum extent possible and consistent with safety, efficiency and economy".

This is an area to consider seriously to avoid accidents, save lives, equipment and other related losses. Safe work procedures and standards to be used, should be incorporated into normal job training.

4.1.2.4. Public Relations

In recent times, mines have had to interact with communities who are quite enlightened or aware of ~~the~~ their human rights, short and long term effects of mining on themselves and their environment. Conflicts have arisen in certain areas because of this awareness.

The general public also needs to know more about the benefits of mining. This is quite lacking as the public views mining as a nuisance and a dirty job fit for low-class people.In view of this, it is appropriate to have a well established public relations department to develop and maintain cordial relations with the public in general and surrounding communities in particular.

4.1.2.5. Training

Education, training and manpower development are of prime importance these days for all levels of employees whether on the job or off the job with regards to specialisation, technological changes- new processes and methods, equipment, communication systems etc. Technology changes with time. Many functions for example, survey computations which were performed manually some years ago, can now be performed at a higher rate and accuracy, with the computer. This is only possible if the people involved are equally trained to move with the times. An educated and trained workforce is the best in the achievement of company objectives. It is therefore imperative that, mines without training schools or centres get some.

4.1.2.6. Systems Analyses

Technology has advanced so much that, computers now exist for

fast and accurate processing of data relating to many areas such as mining, survey, geology and accounting in the mines. For the mines to enjoy such facilities to the maximum, it is necessary to establish their own computer centres.

4.1.2.7. Marketing

This is an important area to consider for organisations that produce items for sale. Currently, marketing is no problem for the mines because they have the Bank of Ghana and Swiss Bank as their outstanding customers. Mines like Ghana National Manganese Corporation and Ghana Bauxite Company Limited have contract sales with other companies outside the country. However, when it becomes necessary for them to sell their products individually which is envisaged for the future, marketing departments should be established.

4.2. DISCUSSIONS

The organisation charts have been drawn both subjectively and objectively. They have not been drawn for specific mines but could be altered or modified to meet the different conditions, situations or contingencies on individual mines.

In drawing the charts in line with modern trends, certain activities in already existing charts have been altered, modified or even eliminated.

4.2.1. Proposed organisational structures for large and small mines.

The proposed structure for the large surface mine differs slightly from the existing structures. A geotechnical/ environmental position has been introduced and ranked high. This

is because earth movements, noise, water and dust pollution is normally very high. Such a section when given top recognition and attention would minimise if not eliminate some of these hazards. For the sake of reducing the span of control for the general manager (GM), the mill superintendent has also been placed under the mine manager which is not the normal practice in the Ghanaian mines. This gives the general manager more time to supervise his subordinates. The chief medical officer has also been placed under the administrative manager. Though it is a vital position, its effectiveness may only be negligibly influenced if it is so placed instead of being under the general manager directly.

Similarly, the health and safety officer does not report directly to the general manager, just to make sure that the general manager is not overloaded. Since the head of security deals with protection of live and property, it would not be out of place to have the health and safety officer working under him.

A projects director is very necessary. The size of the mine may require a lot of constructional works, example housing, resettlement, dams etc. Such a person will therefore monitor all such activities on the mine and associated cost with it.

Certain modifications of the chart for a large surface mine have been made to obtain the structure for a small surface mine. A major assumption here, is that, hazards associated with a large surface mine is substantially reduced in the small mine. In this effect no geotechnical/environmental section has been created. The environmental engineer working under the mine superintendent should be sufficient to handle the environmental problems while the civil engineer monitors among other things, problems of ground instability or earth movement. It is also assumed that construction work would be moderate and handled by the civil engineer and therefore no need for a project director.

The mill manager has been placed directly under the general manager. Priority is given to this position because of its

ground instability or earth movement. It is also assumed that construction work would be moderate and handled by the civil engineer and therefore no need for a project director.

The mill manager has been placed directly under the general manager. Priority is given to this position because of its sensitive nature.

The public relation section has been considered essential in both large and small surface mines. This would ensure public education on mining activities and also maintain cordial relation ship with it.

Generally for the small surface mine, lesser positions exist because of the size of work and lower complexity.

4.2.2. Proposed organisational structures for large and small underground mines

Like the proposed charts for the surface mines, the proposed charts for the underground mines also differ slightly from the existing charts.

A geotechnical section is also necessary. This is because significant impacts on the ground as mining gets deeper and deeper. A moderately organised geotechnical section will suffice. Similar reasons as in the cases of proposed charts for surface mines, hold for the public relation officer (PRO), chief medical officer (CMO) and health and safety officer. The health and safety officer, is not however under the head of security.

Because the underground mines are mostly more demanding than surface mines, especially the production and processing lines, it would also be better to maintain seven subordinates for the general manager.

Contrary to the chart for a large underground mine, it has become necessary to replace the geotechnical engineer with the civil engineer who could be with the technical services section. Ground movement would be very minimal if not absent in a small underground mine, so that the civil engineer have to deal with road and other constructional works on the mine.

The administrative and personnel positions as shown for a large underground mine has been combined to form the chief of personnel and administrative (COPA) in the small underground mine. Because of the size of the mine and labour force, these two may be under utilised. Besides, the strive for superiority may bring about conflicts among subordinates.

Because of the size of the mine and work load on the general manager, it is better to have the head of security as part of management rather than performing or reporting specially to the general manager.

The advantages of these new structures are :

i. They take care of the environment,

ii. They take care of health and safety,

iii. Training of personnel is emphasised, and

iv. Geotechnical services are also advocated.

v. All other contemporary issues.

vi. Duplications have been avoided.

vii. Overlaps have been avoided also.

viii. Spans of control have been monitored carefully.

number of people supervised by each manager. Job enrichment would also ensure that basic drives are satisfied, that is by assigning a total task to a person, rather than just one specialised part of it.

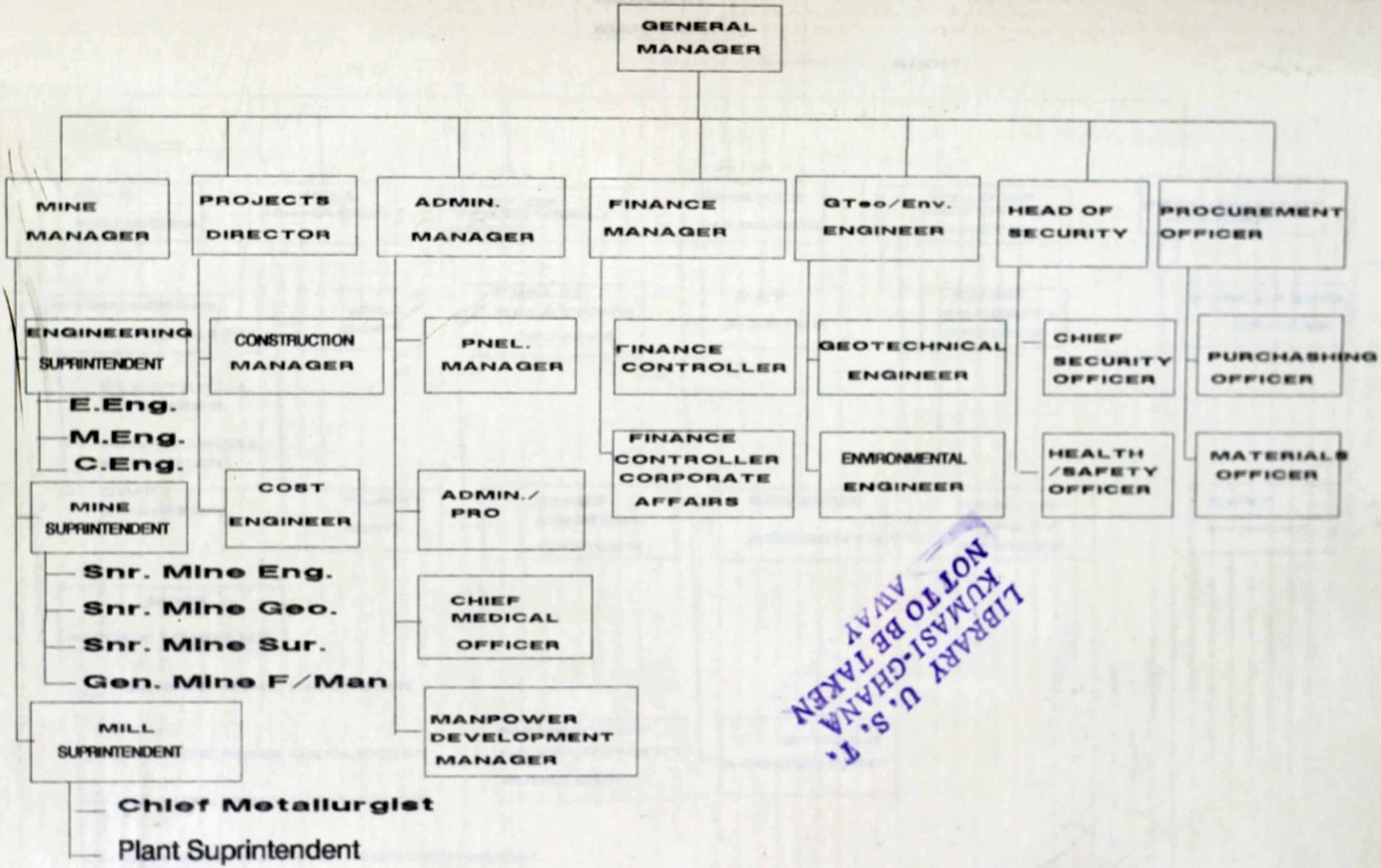


FIGURE 9.1 **Proposed organisation chart for a large surface Mine.**

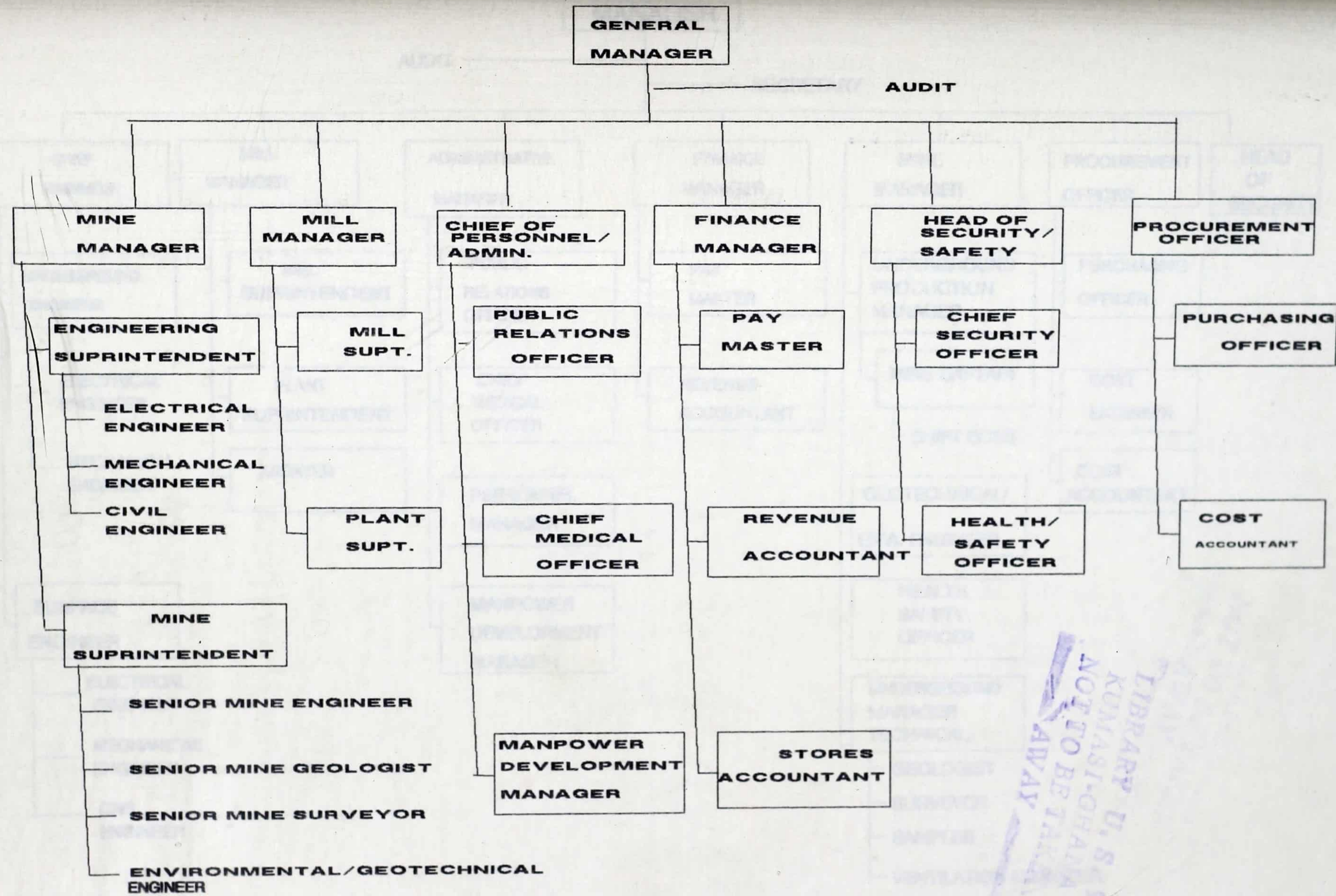


Figure 10.1 Proposed Organisation Structure for a small surface mine

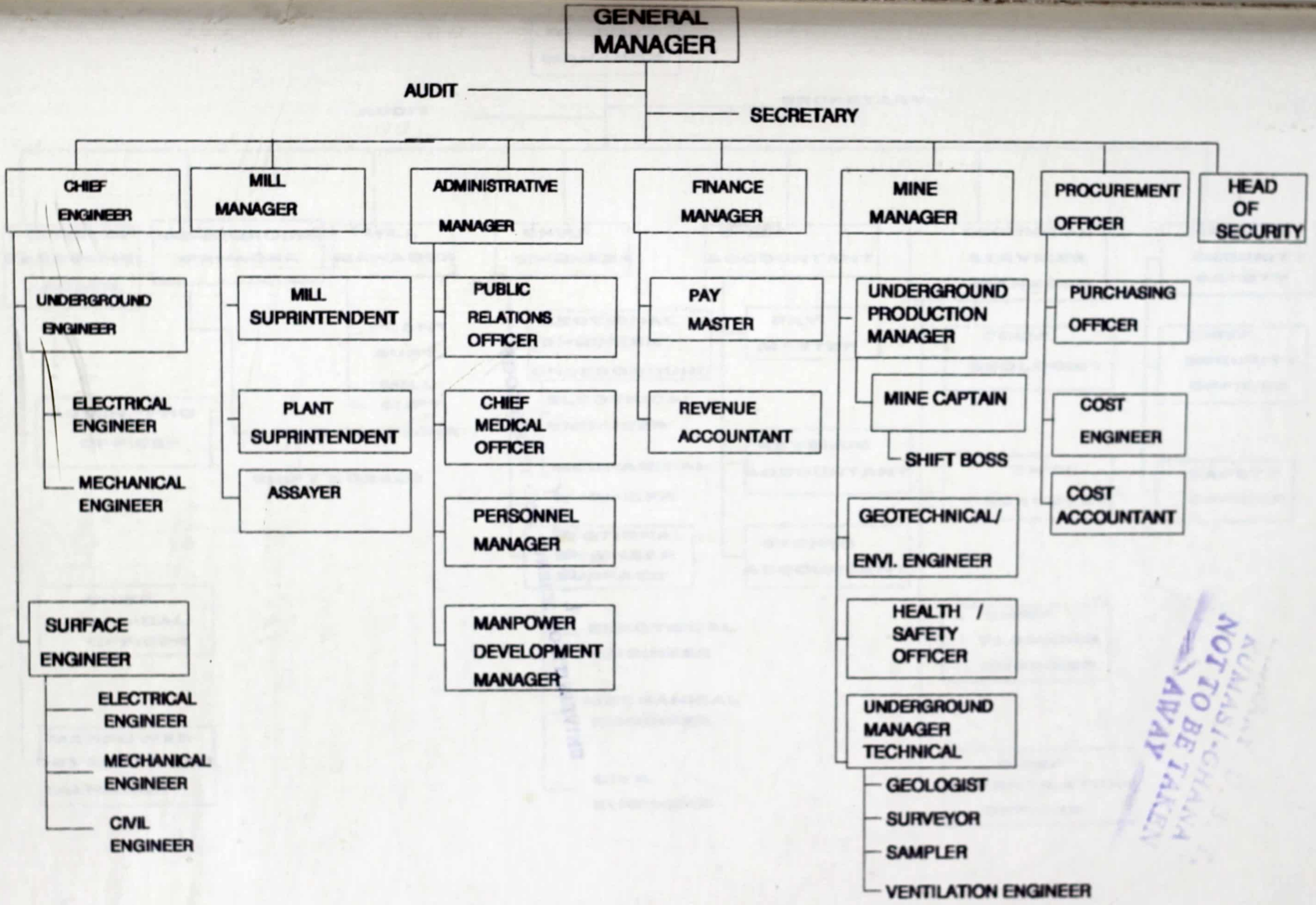


FIGURE 11.1. Proposed organisational structure for a large underground mine.

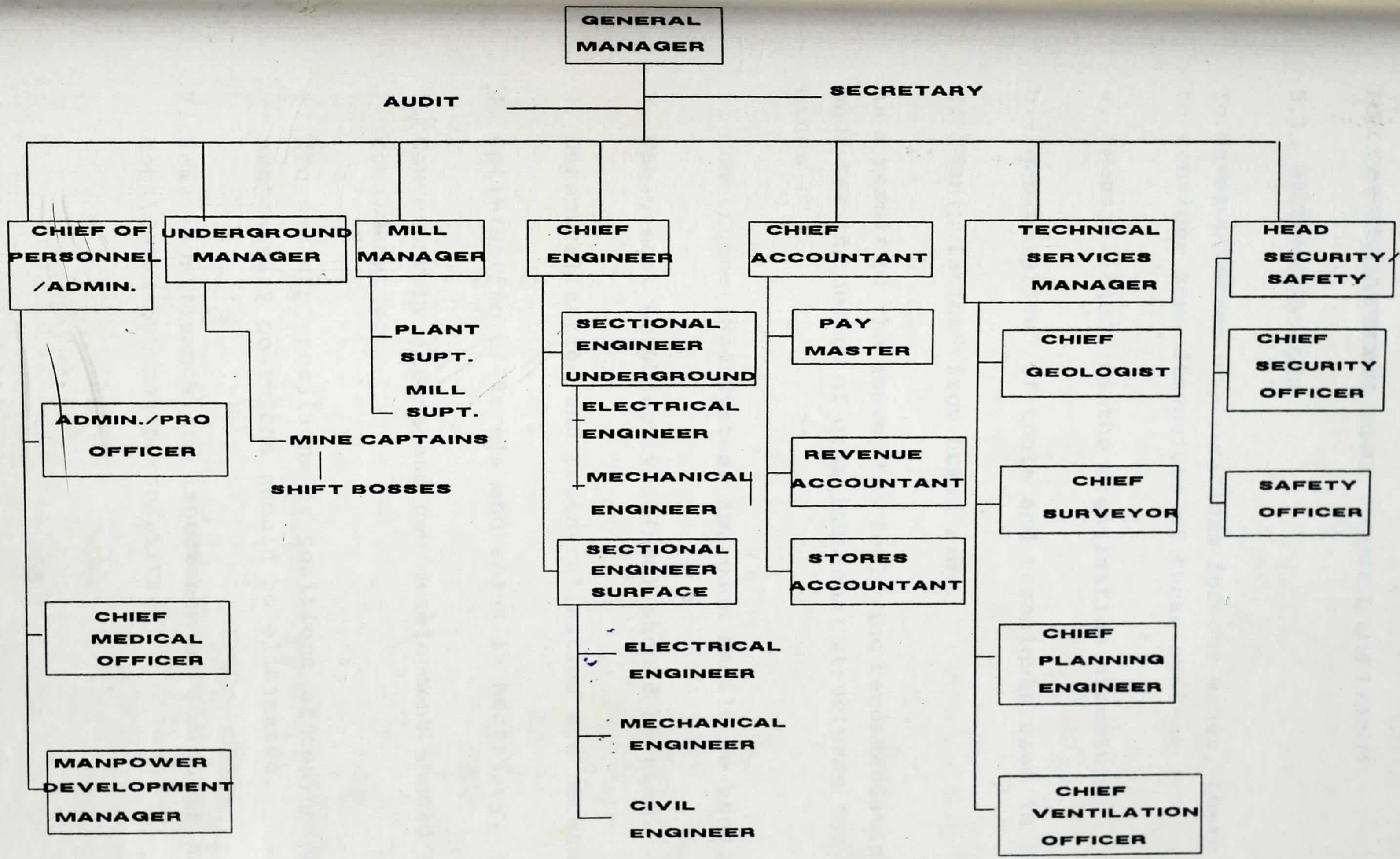


FIGURE
Proposed organisation chart for a small underground Mine.

CHAPTER FIVE

RECOMMENDATIONS AND CONCLUSIONS

5.1. RECOMMENDATIONS

To develop better organisations for our mines, there is the need to consider some dimensions of these systems :

a. "Manipulation" of the organisation structure.

b. "Manipulation" of tools and techniques used in the system.

c. "Manipulation" from human side.

As a result of the above, the following recommendations have been made for the design of organisational structures for the Ghanaian mines :

1. Contingency and Systems Approach should be used.
2. Management by Objectives (MBO) should be used.
3. Decentralisation and recentralisation are necessary.
4. Optimisation of levels and spans is necessary.
5. Contemporary issues and new development should be given due consideration.
6. "To satisfy" positions or positions of convenience and unnecessary positions should be eliminated.
7. Real significance and importance of functions should be considered but not personalities.

8. Types of operations (methods, processes etc.) must be considered.

9. Job enrichment and enlargement should be introduced to reduce or eliminate tall structures.

5.2. CONCLUSIONS

It has been observed that, the kinds and numbers of people required in our present technically sophisticated organisations could be altered to meet current demands and the levels of education attained by personnel on the mines.

An organisational structure cannot remain static but must be dynamic to suit the time. It must therefore be reviewed continually to suit contemporary issues, new developments, and to remove out-of-date positions, etc.

There must be additions, subtractions, modifications, alterations etc to suit contemporary conditions. This has been demonstrated in the work which indicated that, there is the need to remove certain functions such as sectional underground manager and add certain functions as environmental and geotechnical engineers.

However, organisational structures will remain dynamic only if management is committed to changes and are aware of opportunities within and without the establishment, and are aware of changes in its internal environment. There is no "best" or "one" way of the creation and review of these structures. They must be modified to suit individual mines.

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APPENDIX 1.

PRESTEA GOLDFIELDS LIMITED GENERAL INFORMATION

A. Total Number of Staff/Employees

Senior Staff	(Male - 153, Female - 13)	- 166
Junior Staff/Daily Rated	(Male - 1877, Female 107)	- 1,994
	Total	2,150

B. Main Breakdown

Underground	S/Staff	J/Staff	D/Rated	Totals
Mining	45	147	802	994
Engineering	38	154	343	535
Technical services				
Planning]				
Survey]				
Geological]				
Ventilation]				
Diamond Drilling]	17	42	23	82
Total	100	343	1,168	1,611

Surface	S/Staff	J/Staff	D/Rated	Totals
Management(including Audit)	4	2	-	6
Personnel/Admin				
School]				
Welfare/Estate]				
Training]				
Ind. Relations]	18	29	52	99
Reduction	9	23	112	144
Medical	15	69	9	93
Accounts	8	31	-	39
Stores/Procurement	7	8	2	17
Exploration	1	-	-	140
Total	66	298	175	539

C. Others

Security/Watchmen	46
National Service Personnel	15
On secondment from Ghana Education Service	12
Contract/Casual/By-Days(Not Permanent)	153