

THE LAW ON THE ENVIRONMENT AND INSPECTION

ABSTRACT

The paper deals with the work done by the Mines Safety Department in enforcing those provisions of the Mines and Minerals Act, 1976 and the Regulations enacted under this Act which deal with environmental protection and pollution control. In the introduction the paper briefly sketches an outline of other relevant Acts concerning the environment and its protection as it affects the mining industry. These are:-

1. The Actions on Smoke Damage (Prohibition) Act, 1961
2. The Environmental Protection and Pollution control Act, 1990

The paper thereafter goes into a detailed description of the regulations which control gaseous emissions and liquid effluents as they affect the environment both at the place of work and beyond. Waste disposal as regulated under the Mining (Dumps) Regulations, 1972 and the proposed Mining (Pollution Abatement) Regulations are also considered.

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1. INTRODUCTION

It is a popular (mis)conception that before the enactment of the Environmental Protection and Pollution Control Act, 1990 (EPPC), there were no statutory restrictions on those activities which are likely to have an adverse impact on the environment. This is not strictly true. However, it is also true that these activities have a commercial motive (otherwise they would not be carried out) and prior to the late 1980s, it seems the commercial motive overrode everything else bar the preservation of human life.

In as far as mining is concerned, the main pieces of legislation which controlled the conduct of those operations which impinge on environmental quality were, during this period, the following:-

1. The Actions on Smoke Damage (Prohibition) Act, 1961
2. The Mines and Minerals Act, 1976 including the Regulations enacted under this Act.

The Actions on Smoke Damage (Prohibition) Act, 1961 could be considered as an example in which the preponderance of the commercial motive was taken to extremes. Under this Act, the then mining companies of Anglo - American Corporation and the Rhodesia Selection Trust and whom ever might be their successors, were indemnified from any litigation that could be brought up against them for any damage arising from the sulphur dioxide emissions resulting from smelting operations. This Act is anachronistic in today's environmentally aware political atmosphere and a recommendation has already been made for it to be repealed. I will thus not discuss it further.

In the post 1990 period, we are thus left with two Acts: The Environmental Protection and Pollution Control Act, 1990 and the Mines and Minerals Act, 1976. When the lawmakers passed the EPPC, they, by accident or design, failed to include in its provision any reference to other existing acts which covered similar ground, with the exception of section 79 of the Act. This section repealed certain parts of the Natural Resources Conservation Act. Other legislation like the Mines and Minerals Act and bodies formed under them remained untouched. The belated decision to repeal the Actions on Smoke Damage (Prohibition) Act, 1961 is one of the results of this omission since, for as long as this Actions on Smoke Damage (Prohibition) Act stays on the book, it will be in conflict with the provisions of the EPPC on the legality of discharging sulphur dioxide fumes to the atmosphere.

Under the EPPC, the Environmental Council, which is a body of wide representation from both Governmental and non-Governmental institutions with an interest in environmental concerns, is the policy setting body. It is empowered, under section 81 of the Act, to set up an inspectorate which will act to enforce the provisions of the act. However, since, as said above, other inspectorates set up under earlier Acts covering similar ground were left untouched by the enactment of the EPPC, this has resulted in a situation of overlapping functions between the Environmental Council's inspectorate and those inspectorates set up under

the earlier acts such as the Mines Safety Department and the Ionising Radiation Protection Board. The former was set up under the Mines and Minerals Act, 1976 and the latter under the Ionising Radiation Act. It should be stressed that whilst inspectors from these earlier inspectorates have powers only in their specialised areas such as mining right areas for inspectors from the Mines Safety Department, the jurisdiction of inspectors from the Environmental council covers the whole country.

I will now devote the rest of this paper to the functions of the Mines Safety Department as this is where I come from.

2.0 ENVIRONMENTAL LEGISLATION UNDER THE MINING REGULATIONS

Under the provisions of the Mines and Minerals Act, 1976 the Chief Inspector of Mines is appointed to be responsible for all matters concerning safety and health of all prospecting, exploration and mining operations in Zambia. He heads the Mines Safety Department in the Ministry of Mines and Minerals Development. The Department is thus established to enforce the provisions of the Mining Regulations and its addendum, the Mining (Dumps) Regulations. There are also the Mining (Pollution Abatement) Regulations which are currently under consideration. These are meant to expand the detail and scope of the Department's environmental inspection duties.

2.1 GASEOUS EMISSIONS

As mention above, the main aim of earlier pieces of legislation which sought to place restrictions on what mining processes could be carried out was to save lives. Environmental concerns such as the effect of "acid rain" producing sulphur dioxide emissions on the environment or the effect of effluents on aquatic species was only given secondary importance. Aesthetic considerations such as changes to scenery caused by the building of tailings dams received the least concern. This philosophy manifested itself in legal provisions whereby the restriction on emissions was placed on the stipulation of a maximum concentration of the gas in the ambient air rather than on the total amount of gas to be emitted. Thus according to Mining Regulation 902(2)(b) which says (Quote): "The ventilation shall be deemed adequate if it ensures that the amounts of carbon dioxide, carbon monoxide, nitrous fumes, sulphur dioxide and hydrogen sulphide in the general body of the air do not exceed the quantities set out against each such gas in column 2 in the second schedule to these regulations. The second schedule is given in table below:-

TABLE 1 SECOND SCHEDULE (REGULATION 902(2)(b))
MAXIMUM PERMITTED QUANTITIES OF CERTAIN GASES

COLUMN 1 (DESCRIPTION OF GAS)	COLUMN 2 (MAXIMUM PERMITTED) (QUANTITY OF GAS IN PPM)
1. CARBON DIOXIDE	7500
2. CARBON MONOXIDE	100
3. NITROUS FUMES	10
4. SULPHUR DIOXIDE	20
5. HYDROGEN SULPHIDE	20

Zambia is relatively lucky in that atmospheric and topographical conditions on the Copperbelt favour a rapid dispersal sulphur dioxide gases when they are vented through a stack. On certain days however when there is a temperature inversion, the gases do not disperse as quickly and whole sections of towns like Kitwe, Mufulira and Luanshya do get covered in a blanket of these fumes, leaving the residents coughing and spluttering. Although the Regulations do not apply to conditions in the townships, the mining company can on such occasions be said to be in contravention of Mining Regulation 902(2)(b) at least inside the works area. Mining Regulation 937(1) which says (Quote): "Adequate means shall be provided and used for the positive removal at source or as near thereto as practicable of any toxic substance (other than dust) which may escape or be released from any surface plant or building in which such substance is handled, processed, stored or evolved"; and Mining Regulation 937(2) which also says (Quote):

"Any substance removed in compliance with sub-regulation(1) shall be disposed off in a safe manner", can also be said to have been contravened on these occasions when the temperature inversion prevents the adequate disposal of the sulphur dioxide. Again the disposal, through the stack, of substances like sulphur dioxide which cannot be easily decomposed but do have a cumulative effect on the environment through acid rain is a concept which is increasingly being thought of as unsafe disposal.

In the situation where a toxic substance not already specified in the second schedule is encountered either by change of processing route or material being processed, Mining Regulation 903(a) says (Quote):

"The Chief Inspector may, by notice in the Government Gazette, prescribe the following:

- (a) Any gas or fume which he may deem to be toxic (other than those already prescribed in the second schedule) and the maximum permissible amount of such gas or fume content in the general body of the air",

It quite so often happens that there is some dispute about the measurements taken, such as was the case in a parallel sampling campaign for sulphur dioxide at Nkana Smelter carried out between Mines Safety Department and Nkana Division officials. The two teams used a Drager tube which gave spot values. At the same time Nkana Division, as a back up, also used an AGL port sampler which gave a time weighted average over a period of eight hours. Drager tube results showed concentration values of 425ppm whilst the AGL port sampler gave average results of about 0.2ppm. Mining Regulation 916 says (Quote):

"Every determination of the amount of toxic gas or harmful dust made in pursuance of the Regulations shall be made by, and the results evaluated by, such means as the Chief Inspector shall approve".

The Chief Inspector accordingly refused to accept the results of the AGL port sampler. This forced Nkana Division to recheck their determinations and as a result they came up with new figures in which concentrations of 80ppm were recorded in some areas of the smelter. As a result of this, certain areas of the smelter have been classified as restricted areas to which only people with respirators can go to. A similar controversy also arose at Luanshya Smelter during the trial smelting of Ertseberg concentrates. The concern this time was arsenic compounds in the smelter off gases. There was no time for arsenic to be added to the prescribed gases as provided for under Mining Regulation 903(a). However, Luanshya Division and the Mines Safety Department agreed, informally, to use the ACIGH maximum figure of 0.2ppm total arsenic trioxide in determining whether the smelting operations were safe. Drager tube results gave values of about 2ppm whereas AGL port sampler results were of the order of 100-1000 times less. Thus depending on which values you decided to believe, the operation was either safe or unsafe. Although this question was never completely resolved, Luanshya Division later decided it did not want to go into a contractual agreement for the treatment of these concentrates on amount of the environmental risks posed.

2.2 LIQUID EFFLUENTS

With regard to liquid effluents from mining operations, Mining Regulation 2107 says (Quote):

"The Manager shall ensure that any effluent water discharge from any treatment or other process is so discharged as to comply with the provisions of the water ordinance".

The Trade Effluents Act, 1985 is the water ordinance followed by the Mines Safety Department. This fixes the maximum concentrations of total dissolved solids (TDS), total suspended solids (TSS), biological and chemical oxygen demand (BOD and COD) and various individual elements and compounds in the effluent and NOT in the discharge stream at a point down stream of the confluence of the effluent with the stream. By calling upon Mining Regulation 205, an inspector can ask from the Manager for the figures of the concentrations in the effluent which are of concern. The Regulation says (Quote):

"Every person on the mine shall to the full extent of his ability furnish any inspector with the necessary means for making any entry, inspection examination or inquiry in pursuance of these Regulation and any such person who fails to do so or wilfully obstructs an inspector in the execution of his duty shall be guilty of an offence".

At the moment, the most serious problems with effluent discharges are the sulphates from leach plants at Nkana, Chambishi and Nchanga. The sulphate concentration has been known to rise to a value of several thousand ppm when the law stipulates a maximum value of 400ppm. Total suspended solids in the pollution control dam overflow to Mushishima Stream at Nchanga is also a problem. ZCCM is at present evaluating a proposal forwarded by the Mines Safety Department on the control of sulphates in the effluents whilst another project to divert the effluents from the Tailings Leach Plant to Chingola Open Pit will, it is hoped, get rid of the suspended solids problem.

3.0 ENVIRONMENTAL LEGISLATION UNDER THE MINING (DUMPS) REGULATIONS

On 25th September 1970, an inrush of tailings mud from a dam overlying mine workings at Mufulira Mine led to the partial inundation of the mine and the death of 89 men. Such a tragic and spectacular example of the possible dangers posed by the mine dumps led to the enactment of the Mining (Dumps) Regulations of 1972.

These Regulations are mostly concerned with the security of the dumps in the need to prevent either a recurrence of a Mufulira Mine type disaster or the burial of surface structures through the fluid contents of these dumps. However, they do also contain provisions to ensure that these dumps do not become sources of pollution or nuisance to the people living in its surrounding environment.

It would appear that the effect that these dumps have on the scenery is addressed by the nuisance provision but this has never been a reason to deny permission for the establishment of a dump if no other economically feasible spot can be found. Some of these dumps, like the overburden dumps at Nchanga, have become an Engineering marvel on man's ability to literally shift mountains although their windswept, treeless sides are an environmentalist's nightmare.

To ensure that the concerns on the security of dumps and prevention of pollution there-from are addressed, the regulations call for the appointment of persons who will be charged with such responsibilities. According to Mining (Dumps) Regulation 6(1)(Quote):

"For every classified dump there shall be appointed by the Manager a competent person or persons to supervise:-

- (d) the making and keeping of the dump secure;
- (e) any provision for the prevention of pollution of the surroundings or abatement of nuisance;
- (g) the programme of rehabilitation in the case of a closed dump".

Regular reports are demanded on these dumps and according to Mining (Dumps) Regulation 9 which says in parts (Quote):

- (1) "In the case of a mine with which an active classified dump is associated the Manager shall obtain a report from a person competent to make a report on the dump..... on every matter which might affect the security of the dump One copy of such report shall be kept at the office at the mine and be open to inspection by an inspector and a copy thereof shall be sent to the Chief Inspector".
- (3) "Every report obtained for the purpose of this regulation shall contain in particular:-
 - a) an opinion whether the dump is secure
 - e) the nature and extent of inspection and supervision which in the opinion of the person making the report are necessary to be carried out and the measures which in his opinion are necessary to be taken during dumping operations for the purpose of ensuring the security of the dump and its surroundings and the avoidance of pollution and prevention of nuisance".

In the case where a mine closes down, Mining (Dumps) Regulation 18 has the following to say (Quote):

"In the event of the temporary or permanent closing down of any mine or abandonment or termination of any mining right with which an active or closed classified dump is associated, all plans, sections, reports and records relating to dumps associated with the mine shall be disposed of as required under regulation 506 of the Mining Regulations".

Mining Regulation 506 in turn has the following to say (Quote):

"All mine plans, survey co-ordinate ledgers, calculation books and note books shall be properly numbered and indexed and shall:-

- (a) upon the temporary closing down of any mine be retained for safe keeping on the holder's responsibility in a place and in a manner to be approved by the Chief Inspector:

Provided that, if any data be handed over to the Chief Inspector for safe keeping upon such temporary closing down, such data shall be treated as confidential; or
- (b) before the permanent closing down of any mine abandonment, forfeiture or other lapse of mining rights, be lodged by the Manager at the office of the Chief Inspector; all such data lodged with the Chief Inspector shall at his discretion be available for reference to any interested party and for the preparation of copies therefrom.

4.0 THE PROPOSED MINING (POLLUTION ABATEMENT) REGULATIONS

The explosion of concern over the environment in recent years has rendered inadequate, the present regime of regulations controlling mine operations which were enacted in an earlier era. The Mines Safety Department has found that it cannot effectively enforce provisions in pollution control and environment protection to public expectations if these provisions are only implicitly referred to in the present regulations. As a result, the Mining (Pollution Abatement) Regulations have been drafted and a copy submitted to all interested parties for their comments. To avoid potential conflict with the provisions of the EPPC, Mining (Pollution Abatement) Regulation 3 says at the outset that these regulations will always be subsidiary to the provisions of the EPPC.

In the proposed regulations, the emission of sulphur dioxide becomes a penalty offence, chargeable on the basis of tonnage discharged to the atmosphere. In the proposals an operator has to capture at least 70% of all the sulphur dioxide he produces or be penalised at the rate of K3,000 for every tonne of the gas vented to the atmosphere in excess of the allowable 30%. Thus in the case of Mufulira Smelter which in 1992 discharged 163,364 tonnes of sulphur dioxide to the atmosphere, the tonnage, after the allowable 30%, would have left a chargeable amount of 114355 tonnes. The fine would thus have been K343 million. This might seem a lot of money but in actual fact the regulations are lenient by international standards. European and American laws normally require a sulphur dioxide capture in excess of 90% and a fine of the order of \$1,000 (i.e. K500,000 at present exchange rates) for every tonne of sulphur dioxide above the allowable amount that is discharged. The power to vary the percentage allowed and rate of fine is to be vested in the Minister.

The regulations also specify in detail how liquid effluents shall be discharged and the procedure of reporting on these effluents. However, a penalty in the case whereby the standards are breached has not yet been specified.