

THE MINES AND MINERALS ACT

THE MINES AND MINERALS (ENVIRONMENTAL) REGULATIONS [ARRANGEMENT OF REGULATIONS]

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**SECTION 76-MINES AND MINERALS
(ENVIRONMENTAL) REGULATIONS**

*Statutory
Instrument
29 of 1997*

Regulations by the Minister

PART I

PRELIMINARY

1. These Regulations may be cited as the Mines and Minerals (Environmental) Regulations.

Title

2. In these Regulations, unless the context otherwise requires-

Interpretation

"Council" means the Environmental Council of Zambia established by the Environmental Protection and Pollution Control Act; Cap. 204

"competent person" means any person appointed as such by a mine manager, to enforce these Regulations within a mine licence or permit area;

"contaminant" means a substance or physical agent or a combination of substances and physical agents that may contribute to, or create, pollution;

"decommissioned dump" means a dump where dumping operations have ceased but the dump has not been closed;

"developer" means a person who holds a licence or a permit issue under the Act and who undertakes a new mining operation or mining related project to repair or extend an existing mine or mining operation;

"Director" means the Director of Mines Safety appointed under section *eighty-three* of the Act;

"environmental impact statement" means a statement on the impact of the mining operation on the environment submitted to the Director under regulation 5;

"inspector" means a person appointed as an inspector under section *eighty-three* of the Act;

"project brief" means a report made by the developer including preliminary predictions of possible impacts of a proposed exploration, prospecting or mining operation on the environment and constituting the first stage in the environmental impact assessment process;

"proprietary information" means any information relating to any manufacturing process, trade secret, trademark, patent, copyright, breeder's right or formula protected by law or by any international treaty to which Zambia is a party;

"scheduled mine" means any mine specified in the First Schedule of the Pneumoconiosis Act and includes any scheduled place specified in the Cap. 326

Second Schedule to that Act;

"toxic substance" means a poisonous gas, vapour, fume, dust or other substance that may cause injury, or adverse pathological changes, to human beings or animals or cause adverse physiological changes to the environment;

"underground" means beneath the surface of the ground to which access may be by way of a ramp, adit raise, shaft or winze, but does not include an open pit or quarry;

"workings" means an excavation made for the purpose of searching of winning minerals;

PART II

ENVIRONMENTAL IMPACT ASSESSMENT

3. (1) A developer shall prepare and submit six copies to the Director, of an environmental project brief before undertaking any prospecting, exploration or mining operations. Environmental project brief

(2) For the purpose of prospecting exploration or mining operations under these Regulations a developer shall appoint a mine manager.

(3) A mine manager appointed under (2) shall employ a competent person.

(4) A competent person referred to in sub-regulation (2), shall-

(a) in relation to any duty or function, have adequate training and experience so as to enable him to perform such duty or function under these Regulations, without any avoidable danger to himself or any other person; and

(b) have the relevant academic qualifications in mining environmental management, recognised by the Director and should have a minimum of two years relevant industrial experience.

(5) The environmental project brief referred to in sub-regulation (1) shall be prepared by a competent person.

(6) The environmental project brief referred to in sub-regulation (1) shall contain the information set out in the First Schedule to which shall be attached-

(a) a brief statement on the impact of the prospecting, exploration or mining operations on the environment; and

(b) information on any remedial action, if any, to be implemented and complied with.

(7) The Director shall comment on the environmental project brief and shall, within ten days of receipt of such environmental project brief, make recommendations to the Council for consideration.

(8) The Council shall, within forty days of receipt of the environmental project brief, inform the Director of its decision.

(9) If the environmental project brief is incomplete, the Council shall send it back to the Director with comments, and the Director shall inform the developer referred to in sub-regulation (1), to re-submit the environmental project brief within twenty-one days.

(10) The Director shall write to the developer authorising him to develop the mine, if the mining operation has no significant impact on the environment.

(11) This regulation shall apply to-

(a) all proposed mining operations whether they are part of a previously proposed mining operation or not;

(b) any alterations, modifications or extensions of any existing mining operation, which the Director or the Council directs, based on the information contained in the project brief, that an environmental impact assessment should be prepared.

(12) The provisions of the Environmental Protection and Pollution Control (Environmental Impact Assessment) Regulations, 1997 relating to environmental project briefs shall apply to any application made under this regulation.

4. (1) Where the Director determines that the exploration, prospecting or mining operation is likely to have a significant impact on the environment, the Director shall request the developer to prepare an environmental impact statement in accordance with these Regulations. Environmental impact statement procedure

(2) The environmental impact statement referred to in sub-regulation (1) shall be prepared by a competent person.

(3) The provisions of sub-regulation (3) of regulation 3 shall apply to this Regulation.

(4) The developer referred to in sub-regulation (1) shall submit nine copies of the Environmental impact statement to the Director within sixty days of receipt of the request from the Director.

(5) The environmental impact statement shall contain the information set out in the Second Schedule.

(6) If the environmental impact statement is unacceptable or significantly incomplete, the Director shall, within thirty days of receipt of such environmental impact statement, inform the developer, stating-

(a) the issues that need further consideration;

(b) that he should re-submit the environmental impact statement with alteration or corrections within thirty days of that request; or

(c) any further data to be collected.

(7) The Director shall register each environmental impact statement.

5. (1) The environmental impact statement shall contain-

Contents of
environmental
impact
statement

(a) an executive summary of the impact of the exploration, prospecting or mining operation on the environment;

(b) an environmental management plan;

(c) a plan for rehabilitation and management; and

(d) the estimated cost of protecting the environment.

(2) The cost of protecting the environment referred to in paragraph (c) of sub-regulation (1) shall include-

(a) the operational cost of protecting the environment, covering the full life of the mine;

(b) the cost of rehabilitating the mine, covering the full life of the mine;

(c) the cost of decommissioning; and

(d) the operational cost of protecting the environment after the closure of the mine.

(3) The estimate of the cost of the rehabilitating the mine shall be in the form set out in the Third Schedule.

(4) The developer shall make a commitment, in writing, to the Director to-

(a) meet the costs referred to in sub-regulation (2); and

(b) implement the environmental impact statement.

(5) The developer shall attach to the environmental impact statement-

(a) a map showing the location of the tailings, waste and overburden dumps;

(b) a map showing the area covering the mining right or permit and the location of the dumps in relation to the mine structures and the natural and physical features;

(c) the total tonnage and chemical composition of the materials dumped; and

(d) the statement of any rehabilitation work to be undertaken.

(6) The map referred to in paragraph (a) of sub-regulation (5) shall be-

(a) made of durable material;

(b) deposited at the office of the Director and updated by every thirteenth day of September of each year, and

(c) updated immediately on the cessation of mining, abandonment of a mine or at the request of the Director.

(7) A developer shall appoint a competent person to update the environmental impact statement once a year.

6. (1) A developer may apply to the Director for a partial or complete closure of a mine.

Mine site
closure

(2) The application referred to in sub-regulation (1) shall include an audit report on the environment surrounding the mine site which shall be prepared by an independent person.

(3) A mine site shall be closed within sixty days of the application referred to in sub-regulation (1), after all the conditions under these Regulations have been met.

(4) The Director shall issue a closure certificate for any mine closed and the mining right or permit or part thereof shall be cancelled by the Minister.

7. (1) The Director shall keep a record of an environmental impact statement, map or other document for any mine temporarily or permanently closed or abandoned.

Records of
closing down
mine

(2) The records referred to in sub-regulation (1) shall be open for inspection by the public during normal working hours.

(3) Notwithstanding subsection (2), the records referred to in that subsection shall not include proprietary information.

8. (1) An Audit report on the impact on the environment of any exploration, prospecting or mining operation shall be prepared by two independent competent persons and shall contain information as to whether the environmental impact statement is being implemented and complied with.

Audit of
environmental
impact

(2) Two copies of the report referred to in sub-regulation (1) shall be submitted to the Director for evaluation.

(3) The Director shall, within thirty days of receipt of the report referred to in sub-regulation (2), notify the developer of any modifications the Director may consider necessary and shall state when the next audit on the impact of the exploration, prospecting or mining operation on the environment shall be conducted.

(4) The first audit on the impact of any exploration, prospecting or mining operation on the environment shall be conducted within fifteen months of commissioning such exploration, prospecting or mining operation.

9. (1) The Minister may, on such conditions as he may determine, exempt any prospecting, exploration or mining operation from the operation of any provision of these Regulations in accordance with the Act, or, where a developer is conducting any experiments or tests on such conditions as the Minister may determine.

Minister's powers to exempt

(2) The Minister may delegate his function under sub-regulation (1) to the Director.

PART III

MINE DUMPS

10. In this Part, unless the context otherwise required-

Interpretation of Part

"active dump" means any dump where dumping operations are carried out and which has not been closed;

"classified dump" means a dump consisting of material deposited and accumulated-

(a) wholly or mainly in solid form where-

(i) the area covered is more than ten thousand square metres and the height is more than two metres;

(ii) the height of the dump is more than fifteen metres; or

(iii) the average gradient of the land covered by the material is more than one in twelve;

(b) mainly in solution or suspension where-

(i) any point is more than four metres above the level of any part of the adjacent land and is less than fifty metres from the perimeter of the

dump; or

- (ii) the volume is more than ten thousand cubic metres;

"water course" includes any river, stream, ditch, drain, sewer, culvert, cut, dyke, sluice and passage through which water, whether processed or not processed, flows.

11. (1) A developer shall apply and give thirty days notice to the Director, before commencing any dumping operations-

Procedure to be followed before dumping

- (a) specifying the material to be dumped;
- (b) giving a description of the site; and
- (c) stating whether the dump shall be a classified dump or not.

(2) A developer shall submit a report containing information set out in the Fourth Schedule to the Director which shall be prepared by a competent person and shall state the safety precautions and the other measures to be taken to protect the environment surrounding the dumping area, before dumping any material on that site.

(3) Where the Director approves the application referred to in subsection (1) the developer shall, not less than thirty days before he commences any dumping operations, submit to the Director a plan delineating the area where the dump will be situated, showing-

- (a) one thousand metres from the boundary of the adjacent land at a scale of not less than 1/5,000, contoured to, oriented to, and co-related to, the mine surface plan;
- (b) all the mining workings, whether abandoned or not, of any previous land movement, spring, well, watercourse or any other natural, geological or topographical feature which may affect the security or safety of the dump or which may be relevant to determine whether the land is suitable for dumping operations; and
- (c) any surface installations.

(4) If the Director considers that the report referred to in subregulation (1) is not complete, he may direct the developer-

(a) conduct any additional survey tests, borehole or ground-water measurements; or

(b) meet any other conditions as he may think necessary and may request that a supplementary report be made by the person who prepared the previous report or from a competent person.

(5) If the Director does not approve the dumping application, he shall give reasons for such refusal within thirty days of receipt of such application.

(6) A developer who is aggrieved by a decision of the Director under this regulation, may appeal to the Minister.

12. (1) A developer shall make rules relating to any dumping operations carried out on an active classified dump specifying-

Rules for
dumping
operations

(a) the manner in which the dumping operations are to be carried out;

(b) the precautions to be taken to avoid polluting the environment;

(c) the safety precautions to be taken relating to the dump; and

(d) how pollution to the environment shall be monitored.

(2) A developer referred to in sub-regulation (1) shall appoint a competent person to inspect every classified dump and its surroundings, every week, to ensure that-

(a) the drainage and the ground between the dump and the inter-section of vertical planes drawn from the boundaries of any mine workings is less than five hundred metres from the nearest edge of that

dump;

- (b) the dumping rules are being complied with; and
- (c) the measures to control pollution are being complied with.

(3) The competent person referred to in sub-regulation (1) shall make a report which shall be open for inspection by an inspector stating-

- (a) any defect found in any records kept for that purpose at the mine;
- (b) the progress made in implementing the provisions of the environmental impact assessment; and
- (c) any pollution to the environment not initially detected or predicted.

(4) The competent person referred to in sub-regulation (1), shall bring to the immediate attention of the developer, any pollution to the environment not initially detected or predicted, to the developer's attention and remedial action.

13. (1) A developer shall apply in writing to the Director to resume dumping on a decommissioned dump, not less than thirty days before commencing any dumping operation stating-

Procedure for
dumping on
decommissioned
dump

- (a) the description of the site on which the dumping will be made;
and
- (b) the material to be dumped.

(2) The Director shall-

- (a) determine whether the dump shall be a classified dump or not; or
- (b) notify the developer referred to in sub-regulation (1) that the dump shall be a classified dump, if that dump may have an impact on the environment.

(3) Where the Director approves the application for dumping on a decommissioned dump such developer shall follow the procedure referred to in regulation 11, and shall, before dumping any material on that decommissioned dump, give thirty days notice to the Director.

(4) Where dumping is to be resumed on a previously decommissioned classified dump, new rules shall be made and the provisions of regulation 12 shall apply.

(5) A developer shall make a report to the Director if-

(a) such developer makes any change or variation to the specifications of the dumping site, which he originally submitted to the Director, that may affect the safety of that dumping site;

(b) such developer makes any change or variation to the mining operations which may have an adverse impact on the environment; or

(c) the mining operations advances within a horizontal distance of five hundred metres from the boundary of the dump.

14. A developer shall not dump any material which is wholly or partially in solution or suspension or any solid material which may turn into a solution or suspension, over an area vertically above any mine workings, whether abandoned or not, or is within a horizontal distance of one hundred metres from where the line of break from the mine workings intersects the surface.

Prohibition of dumping over mine

15. (1) A developer shall ensure that a dump is properly drained and shall not carry out any dumping operations that may cause accumulation of water in, under or near a dump, making the dump insecure or dangerous.

Drainage of dump

(2) The drainage from any dumping operation shall not enter any mine opening or subsiding ground over any mine workings, whether abandoned or not.

(3) The developer referred to in sub-regulation (1) shall ensure that-

(a) the drainage system of a dump is maintained and is in proper and safe working condition;

(b) regular inspections of the dump are made;

(c) the dump is kept secure and safe;

(d) measures to control pollution are being effected; and

(e) the dumping operations are being carried out in accordance with this Part.

(4) A developer shall keep a record of any maintenance or action taken to remedy any defect in the drainage system.

16. (1) A developer shall appoint a competent person to supervise any person charged with dumping any material in a classified dump to ensure that-

Supervision of
drainage system
by competent
person

(a) the design and the management of the dump; and

(b) the rehabilitation and decommissioning of every dump is done in accordance with these Regulations.

(2) A competent person appointed under sub-regulation (1), shall make a report-

(a) of every defect revealed during any inspection of the dump and any action taken to remedy such defect;

(b) on the condition of the drainage of the dump; and

(c) on any pollution to the environment that is revealed during inspection and the action to be taken to control such pollution.

17. (1) Notwithstanding sub-regulation (2), a developer shall obtain a report from an independent competent person on-

Reports by
independent
person
regarding
classified dump

(a) each active classified dump;

(b) the condition of the ground between a dump and all surface intersections of vertical planes drawn from the boundaries of any mine workings less than one hundred metres from the nearest edge of the dump;

(c) every matter which may affect the security or safety of the dump, ground or mine workings;

(d) any significant impact on the environment not originally predicted; and

(e) the progress made in implementing the environmental impact statement.

(2) The report shall contain information stating-

(a) whether or not the dump is safe;

(b) whether there has been any change in the design of the dump or in the nature of the material deposited;

(c) in detail, whether there may occur or there is likely to occur any subsidence or other surface movement which may affect the safety of the dump or any mine workings, whether abandoned or not;

(d) any surveys, tests, boreholes or groundwater measurements made for purposes of the report and the results;

(e) the precautions to be taken during any dumping operations to avoid pollution of the environment and prevent a nuisance; and

(f) any recommendation to modify the environmental impact

statement.

(3) The report referred to in sub-regulation (1) shall be obtained-

(a) at intervals of two years;

(b) as soon as practicable after a dangerous occurrence relating to a dump, ground or mine working happens;

(c) as soon as it is practicable after a significant impact on the environment not originally predicted occurs;

(d) after any alteration is made to any specifications or design of a dump; or

(e) if there is any change in the nature of the material dumped which may affect the safety of the dump or the environment.

(4) A copy of the report referred to in sub-regulation (1) shall be kept at the office of a mine for inspection by an inspector and another copy sent to the Director.

(5) If the area was not previously used as a dumping site, the first report shall be made not more than two years after the date on which dumping operations commence.

18. (1) A developer shall, for every active classified dump, keep-

Reports on
active classified
dumps

(a) any record relating to such classified dump obtained under regulation 16;

(b) a record of any written directions given by an inspector;

(c) accurate plans and sections of all the dumps and the dumping area showing clearly and accurately the state of the dump, fifteen months from the date any dumping commences or after such period as the Director may direct in writing;

(d) accurate plans of adjacent land within one thousand metres from the boundary of the dump and the sections showing any surface installation, mine workings whether abandoned or not and any geological or other feature that may affect the safety of the dump;

(e) any record completed at the end of each month relating to the nature, quantity and location of the material deposited in such classified dump; and

(f) a copy of the environmental impact statement.

19. An inspector, competent person or a person in charge of a mine shall inform a developer of any abnormal or unusual matter recorded in any report relating to any dump and the developer shall in turn inform the Director. Reporting of unusual or abnormal matter

20. (1) Within thirty days of ceasing any dumping operations, and after completing the procedure set out in these Regulations a developer shall, apply to the Director for a classified dump to be closed. Closure of dumping site

(2) An application referred to in sub-regulation (1) shall be accompanied by-

(a) an audit report on the impact of the dump on the environment prepared by an independent competent person;

(b) a copy of the environment impact statement;

(c) a copy of the records of the progress made in implementing the environmental impact statement; and

(d) a report on the progress on rehabilitating the dump indicating the environmental status of the dump and the surrounding areas and the amount of work still outstanding to rehabilitate the dump.

(3) The Director shall within four weeks of receiving the application referred to in sub-regulation (1), inform the developer, in writing, whether he accepts or rejects the application.

(4) Where the Director rejects the application he shall inform the developer, in writing, to make any alterations to the environmental impact statement, as he may think necessary.

(5) The report referred to in paragraph (d) of sub-regulation (2), shall be submitted every twelve months throughout the period the dump is being rehabilitated and decommissioned.

(6) The Director shall close a dump when all the conditions have been met by the developer.

21. (1) A developer shall appoint a competent person to inspect-

Inspection of decommissioned classified dump

(a) every decommissioned dump and the surrounding land situated one thousand metres from the boundary of the dump; and

(b) where the environmental impact statement is being complied with.

(2) Where the dump consists of material mainly in solution or suspension form, the inspection shall be at intervals not exceeding six months.

(3) Where the dump consists of material in a solid state, the inspections shall be at intervals not exceeding twelve months.

(4) A competent person referred to in sub-regulation (1), shall make and sign a full and accurate report of every defect or pollution to the environment which he discovers.

(5) The report referred to in sub-regulation (4) shall be kept at the office of the mine for a period of five years and shall be open for inspection by the public during normal working hours.

22. (1) A developer shall submit to the Director-

Report on
decommissioned
classified dump

(a) a report prepared by an independent competent person relating to the safety and environment status of a decommissioned dump not yet closed, at intervals not exceeding-

(i) five years for a dump consisting of material wholly or mainly in solution or suspension form;

(ii) ten years for a dump of material mainly in a solid state;

(b) a special supplementary report as soon as is practicable, if any pollution to the environment relating to a decommissioned dump not yet closed occurs; and

(c) a report within seven days, when the mine workings reach a horizontal distance of five hundred metres from the boundary of a decommissioned classified dump and the effect of such mine workings on the safety of the dump.

(2) The report referred to in sub-regulation (1) shall contain-

(a) the provisions set out in the Fifth Schedule;

(b) information on the safety of the dump;

(c) details of any subsidence or any other ground movement that may affect the safety of the dump indicating any danger to the mine workings;

(d) details of the progress of any rehabilitation work undertaken in accordance with the approved environmental impact statement; and

(e) information on the nature and extent of the inspection and supervision and the measures that should be taken to prevent or control pollution or abate nuisance.

23. (1) A developer shall keep a record at the mine of any plans and sections of a decommissioned classified dump including-

Keeping of plans, sections, etc. of decommissioned classified dump

(a) any particulars of any dumping, building, mining operations or engineering operations which may affect the safety of the dump or any survey or tests;

(b) any accurate plans and sections of every dump and the land adjacent to it, showing the extent of the dump from the date dumping operations ceased and decommissioning began;

(c) information showing the chemical composition and amount of material deposited, in tonnes;

(d) any accurate plans of the land adjacent to the dump, which is within one thousand metres from the boundary of the dump;

(e) any accurate sections of the strata underlying the dump, showing any variation in the thickness or character of the strata, which may affect the safety of the dump;

(f) a report, updated annually, on the progress of rehabilitating the dump and the surrounding area;

(g) any report relating to the dump as provided for under these Regulations; and

(h) any instructions given by an inspector relating to the dump.

(2) Any book, plan or other record referred to in sub-regulation (1) shall be open for inspection by an inspector.

24. (1) A developer shall submit to the Director-

Submission of reports for closed dump

- (a) all reports required under regulation 23;
- (b) a report on the progress of rehabilitating the dump and the surrounding area; and
- (c) the final audit on the environment conducted by an independent person.

PART IV

AIR QUALITY AND EMISSION STANDARDS

- | | |
|--|---|
| <p>25. (1) Except as provided for in the Sixth Schedule, a developer shall comply with the ambient air quality and emission standards established under the Air Pollution (Licensing and Emission Standards) Regulations, when discharging any toxic substance or harmful dust into the atmosphere.</p> | <p>Air quality and emission standards
Cap. 204</p> |
| <p>(2) The Director shall provide air quality limits to a developer where specific air quality limits or guidelines are not provided for under the Air Pollution (Licensing and Emission Standards) Regulations, or under the Sixth Schedule.</p> | <p>Cap. 204</p> |
| <p>26. The provisions of the legislation on Occupational Health and Safety shall apply to any person employed by a developer who is at risk of contracting any occupational disease as a result of any emission or pollutants which may result from any mining operations.</p> | <p>Application of Legislation on Occupational Health and Safety</p> |
| <p>27. A developer shall provide adequate supply of water to suppress dust or fumes generated by a mining operation where effective dust or fume extraction facilities are not available.</p> | <p>Water for dust suppression</p> |
| <p>28. (1) A developer shall provide ventilation which is adequate and effective-</p> | <p>Developer to provide</p> |

adequate
ventilation

(a) as provided in the Sixth Schedule and in the Air Pollution Control (Licensing and Emission) Regulations;

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(b) in any surface plant, building or any part of a mine in which any person travels to and from work or works;

(c) where any dust containing coal, asbestos or siliceous matter is released or may be released; or

(d) where any toxic substance evolves or may be evolved.

29. (1) Any toxic substance or harmful dust collected and not discharged into the atmosphere, as provided for in regulation 26, shall be abated at source or as near to the source as is practicable.

Removal of
toxic substance
or dust

(2) A toxic substance shall not be released from any surface plant or building in which any dust referred to in sub-regulation (1) is handled, processed, stored or evolved.

(3) Where the concentration of toxic substances determined under sub-regulation (1), are suspected to be harmful to any person or the environment, the frequency of determining the air quality shall be increased and steps taken to reduce the toxicity to acceptable levels as provided under the Environmental Protection and Pollution Control Act.

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(4) In determining the air quality under sub-regulation (1) the Director shall specify-

(a) the concentration of gases specified in the Sixth Schedule;

(b) the dust concentrations; and

(c) the concentration of any other toxic substance which is known or suspected to be present.

(5) The Director shall keep a record of the results of the air quality determined under sub-regulation (1), which record shall be signed by the ventilation engineer and the senior mine official of the plant, building or process concerned.

(6) A quarterly report of the results obtained in accordance with sub-regulation (1), shall be submitted to the Director in such form as the Director may determine.

30. (1) The Director shall assess the air quality of a scheduled mine or any mine to determine the air quality of a surface plant at intervals not exceeding thirty-one days. Determination of air quality in surface plants

(2) In making the assessment under sub-regulation (1) the Director shall consider;

(a) dust concentrations;

(b) concentrations of the gases specified in the Second Schedule of the regulations; and

(c) concentrations of any other toxic substance which is known or suspected to be present.

PART V

WATER STANDARDS

31. The water rights of any mining activity shall be as provided for in the Water Act. Water rights
Cap. 312

32. The quality of drinking water provided by a developer to his employees shall be as provided in the Seventh Schedule. Access to
drinking water

33. The quality of any water effluent entering a stream in a mining area Regulating

which is licensed as a discharge site, shall be as provided for in the Third Schedule to the Water Pollution Control (Effluent and Waste Water) Regulations.

effluent water
discharge
Cap. 204

PART VI

STORAGE, HANDLING AND PROCESSING OF HAZARDOUS MATERIAL

34. (1) In this Part, unless the context otherwise requires-

Interpretation

"bowser" means a mobile vessel used for conveying fuel underground or from the surface to underground;

"container" means a movable vessel, which has a capacity of not more than two hundred litres and not less than twenty litres, used for storing or conveying hazardous liquid;

"corrosive" means any substance that by chemical action may cause damage when in contact with any living tissue or any other substance;

"hazardous material" means-

(a) any substance which is a potential source of harm or danger;

(b) any corrosive, inflammable or combustible solid or liquid, ionising radiation and its source or petroleum product; or

(c) any toxic substance, hazardous liquid or hazardous solid;

"highly inflammable liquid" means any liquid which has a flash point of 7 degrees celsius or below;

"inflammable and combustible solid" means any carbonaceous or organic solid capable of self-igniting or of being ignited;

"inflammable combustible liquid" means any liquid which has a flash point below 93 degrees celsius;

"inflammable liquid" means any liquid which has a flash point above 7 degrees celsius but below 60 degrees celsius;

"ionising radiation" means any radioactive substance, whether sealed or unsealed and any machine or apparatus which emits ionising radiation particles charged at a voltage of not less than five kilovolts;

"mobile container" means any vessel mounted on wheels, tracks or skids, whether self-propelled or not, used for the transportation of any hazardous liquid and includes a bowser, tanker and trailer;

"petroleum product" means any derivative or product of crude petroleum oil and includes any liquidified hydrocarbon gas and its distillates;

"portable container" means any vessel which has a capacity of not more than twenty litres used for the storage or conveyance of any hazardous liquid;

"vehicle" means any wheeled or tracked self propelled unit, track or wagon owned or operated by a mine or contractor on the mine;

"tanker" means a mobile vessel used for the transportation of any hazardous liquid, by road or rail, on the surface;

"combustible liquid" means any liquid which has a flash point above 60 degrees celsius but below 93 degrees celsius;

"vessel" means any object or container used to carry hazardous, inflammable or combustible liquid, or petroleum products.

35. Any building, installation or equipment for storing any liquid under this Part, shall be suitable for storing such liquid.

Suitability of building, installation and equipment

36. Any liquid under this Part shall be stored, handled and processed in a manner that is safe and healthy for any person working in that mine. Safe working practice

37. A developer shall ensure that an appropriate code of safe working practice is enforced in accordance with regulation 37. Code of safe working practice

38. Any inflammable combustible liquid shall be classified as follows: Inflammable combustible liquid

(a) class I: any liquid which has a flash point below 38 degrees celsius;

(b) class II: any liquid which has a flash point above 38 degrees celsius but below 60 degrees celsius;

(c) class III: any liquid which has a flash point above 60 degrees celsius but below 93 degrees celsius.

39. (1) Except petrol in a tank of a vehicle, a highly inflammable liquid in excess of twenty litres shall not be stored in any container in a building. Storage of highly inflammable or combustible liquids

(2) Except fuel oil or any liquid stored in an industrial pressure cylinder, a combustible liquid shall not be taken underground without the prior approval in writing of the Director.

(3) No petrol shall be taken underground.

(4) Two incompatible hazardous liquids under this Part shall not be stored in close proximity of each other.

40. (1) Any vessel used for storing, conveying or transporting any hazardous liquid shall- Vessel for storing,

conveying or
transporting
liquid

(a) be sealed with a positive sealing device and where the vapour of that liquid may generate pressure to a dangerous level that container shall be sealed using a pressure relief valve;

(b) have a built in relief mechanism; and

(c) be clearly marked and labelled and, have prominently displayed on it, a label giving an appropriate warning of the dangers of such liquid.

(2) The conditions for storing any hazardous liquid shall be as prescribed in the Eighth Schedule.

41. (1) A person transferring any hazardous liquid shall-

Transferring
hazardous
liquid

(a) only load or unload one container at any one time and shall do so with the help of other people;

(b) use a suitable transfer pump or other safe means, when transferring any liquid into, or from, any mobile container or tank;

(c) not use a vessel that is pressurised or discharge any liquid unless the conditions relating to a pressure vessel are met, in accordance with the provisions of the Mining Regulations, 1997.

(d) use a vessel which is electrically bonded or protected against dangerous electro-static build-up;

(e) take adequate precautions to protect any person from any danger arising from the movement of such liquid; and

(f) not mix one type of inflammable or corrosive liquid with another.

(2) Notwithstanding paragraph (b) of sub-regulation (1), a gravity head of any hazardous liquid discharged may be used where a positive means for stopping the flow of that hazardous liquid is adequately secured at source.

(3) The gravity head of the hazardous liquid referred to in sub-regulation (2) shall not exceed thirty metres without the prior approval, in writing, of the Director.

42. (1) Where the quantity of any hazardous liquid stored inside any building exceeds two hundred litres, that liquid shall be stored inside a storage room set aside for that purpose.

Storage of any hazardous liquid in storage room

(2) The storage room, referred to in sub-regulation (1), shall not contain more than two thousand litres of any hazardous liquid.

(3) The storage room referred to in subsection (2) shall-

(a) be located in such a position that fire may not spread quickly and shall have a minimum of two hours resistance;

(b) have suitable fire-fighting equipment located in suitable positions, outside the room;

(c) be fitted with a high and low system of ventilation flowing outside;

(d) be built with a floor that can easily be drained;

(e) have facilities to relieve pressure where there is likelihood of any danger.

(f) have prominently displayed at suitable places, inside, and outside that room, notices bearing the following inscriptions: "NO SMOKING", "NO FIRES" and "NO NAKED LIGHTS"; and

(g) have electric light bulbs, inside that room, adequately protected

with all switches and fuses affixed outside.

(2) Any vessel kept in the storage room shall be suitably sealed when not in use.

43. (1) Where the quantity of any hazardous liquid stored outside any building in a storage shed exceeds two hundred litres, that shed shall- Storage of hazardous liquid in storage shed

(a) have a space of at least five metres from any cultivation, shrub or grass and other inflammable or combustible materials capable of causing fire;

(b) be constructed of non-flammable material;

(c) have suitable fire-fighting equipment located at suitable positions outside the shed;

(d) be fitted with a high and low system of ventilation flowing outside;

(e) have prominently displayed at suitable places inside and outside the shed, notices bearing the following inscription: "NO SMOKING", "NO FIRES" and "NO NAKED LIGHTS"; and

(f) where illuminated by electric lights, have all bulbs inside that shed adequately protected with all switches and fuses affixed outside that storage shed.

(2) A container containing any liquid kept in the shed shall be kept suitably sealed when not in use.

44. (1) Where the quantity of any hazardous liquid stored on the surface in any open area exceeds two thousand litres, that open area shall- Storage of hazardous liquid in open area

(a) be adequately fenced at a distance of five metres from the

surrounding area, away from any cultivation, shrub or grass and other inflammable or combustible materials that can cause fire;

(b) have prominently displayed, at suitable places outside the fenced area, notices bearing the following inscription: "NO SMOKING", "NO FIRES" and "NO NAKED LIGHTS"; and

(c) have electric light bulbs, within that fenced area, adequately protected with all switches and fuses affixed outside that fence.

45. (1) Where the quantity of any hazardous liquid stored in any vessel exceeds two thousand litres, the conditions set out in the Ninth Schedule to these Regulations shall apply. Storage of hazardous liquid

(2) A plan of the area where the vessel is to be installed and the specifications of the vessel shall be submitted to the Director accompanied by a plan of the site showing how any potential contamination of the soil shall be prevented or controlled.

(3) The Director shall approve the plan referred to in sub-regulation (2) within sixty days of receipt of such plan.

46. (1) A person shall not re-fuel any self-propelled vehicle with petrol or fuel-oil except at a filling station constructed in a mining area in accordance with regulation 47. Re-fueling of petrol and fuel oil in a mining area

(2) When it is impracticable to comply with the requirements under sub-regulation (1), a person may re-fuel from suitably equipped, mobile container with the prior approval, in writing, of the Director, and in case of an emergency, a small quantity of petrol or fuel-oil, sufficient to enable a vehicle to be driven to a filling station, may be taken to that place in a portable container.

(3) The Director may approve, in writing, re-fuelling underground directly from a bowser, in the initial stages of any mining operations, if it is not practicable for a filling station to be constructed.

(4) A person shall not re-fuel at any filling station or at any other place,

while the engine of the vehicle being re-fuelled is running.

(5) A person shall not re-fuel within three metres from any live trolley line conductor.

47. (1) Any filling station in a mining area shall-

Filling station
in mining area

(a) be constructed out of non-flammable materials;

(b) be accessible in not less than two ways;

(c) be ventilated by a flow of sufficient air to dilute any gas emitted during re-fuelling;

(d) have a concrete floor that is impervious and free of cracks and shall be sloped to facilitate cleaning and collection of any spilt fuel;

(e) be provided with suitable fire-fighting equipment;

(f) open between hours of sunset and sunrise on the surface and at all times underground; and

(g) be equipped with suitable electric lighting and the bulbs and tubes for the lighting shall be adequately protected.

(2) A competent person shall be in charge of a filling station or any other place where petrol or fuel-oil is stored.

(3) The provisions of sub-regulation (3) of the Regulation (3) shall apply to this Regulation, with the necessary modifications.

48. A developer shall transport fuel from the surface to the underground or between places underground in a bowser, approved in writing, by the Director.

Transportation
of fuel-oil
underground

49. Any fuel-oil used underground to power any engine shall be as

Specification of

specified in the Ninth Schedule.

fuel-oil
underground

50. The total quantity of fuel-oil permitted underground shall not, as far as is reasonably practicable, exceed the quantity likely to be normally consumed within a period of seven days.

Amount of
fuel-oil
permitted
underground

51. (1) Where any petrol or fuel-oil is spilled in any place it shall be removed immediately, and if, in the process of removing the petrol or fuel-oil, any material is contaminated, that material shall be placed in a suitable container for subsequent destruction or other safe disposal.

Spillage of
fuel-oil

(2) Any person who spills petrol or fuel-oil on an engine or vehicle that person shall immediately ensure that the petrol or fuel-oil is removed.

(3) A person shall not wash any petrol or fuel-oil into any drainage system or any place where it may cause danger or pollution to the environment.

52. Except a bowser, any container, used to transport any hazardous liquid under this Part shall-

Transporting of
hazardous
liquid in
container

(a) be fitted with surge plates;

(b) have filling pipes which extend below the level of the suction pipe;

(c) have a vent of not less than fifty millimetres in diameter, fixed to each vessel and protected by two wire gauze diaphragms which do not corrode, each of which shall have a linear mesh aperture of not less than 0.4 millimetres or more than 0.6 millimetres and diaphragms spaced not less than seventy-five millimetres apart;

(d) be earthed in accordance with the provisions of the Mining Regulations, 1997, during transportation of any hazardous liquid and the resistance of any connection shall not exceed five ohms;

(e) be equipped so that the volume of the liquid in the container may be accurately ascertained at any time;

(f) have prominently displayed;

(i) on the front, rear and each side, the name of the hazardous liquid being transported and its category in accordance with regulation 35;

(ii) any special action to be taken or any action to be avoided, in an emergency concerning the hazardous liquid being transported; and

(iii) any prohibitions to be observed by persons near the mobile container;

(g) be equipped with suitable fire-fighting equipment adequate to combat fire in its initial stage;

(h) be fitted with the requirements specified in the Roads and Roads Traffic Act in relation to that liquid; Cap. 464

(i) have an air space of not less than 2.5 per cent of the total capacity of that container;

(j) have all elements of any articulated container electrically bonded; and

(k) be securely attached to the chassis.

53. A developer transporting fuel-oil in a bowser shall transport such fuel in a bowser-

Transporting
fuel-oil in
bowser

(a) fitted with filling pipes which extend below the level of the suction pipe;

(b) which has a vent of not less than fifty millimetres in diameter, fixed to each vessel and protected by two wire gauze diaphragms that do not corrode, each of which has a linear mesh aperture of not less than 0.4 millimetres or more than 0.6 millimetres and diaphragms spaced not less than seventy-five millimetres apart;

(c) earthed in accordance with the provisions of the Mining Regulations, 1997, and the resistance of any connection shall not exceed five ohms;

(d) clearly marked;

(e) equipped with suitable fire-fighting equipment adequate to combat fire in its initial stage;

(f) fitted with a suitable reflector at each end; and

(g) with an air space of not less than 2.5 per cent of the total capacity of such bowser.

54. Any developer who transports acid using a mobile container or road tanker shall, in addition to the provisions of regulation 52-

Transporting
corrosive liquid
in mobile
container

(a) prominently display on the front, rear and each side of such container or road tanker a notice bearing the following inscription: "DANGER ACID", and shall have a clearly visible flashing light when transporting the acid;

(b) have at all times, at least twenty litres of water to be used for diluting the acid in case it burns any person; and

(c) have adequate chains between the trailer and the tanker at each side of the tow-bar where the tanker is towing a trailer tanker.

55. (1) A person shall not smoke or use any naked lights at any filling station or at any other place where petrol or fuel-oil is stored or where vehicles are re-fuelled.

Prohibition of
smoking and
naked lights

(2) A notice shall be displayed at a filling station and other places referred to in sub-regulation (1) stating the prohibition referred to in that sub-regulation.

(3) A developer shall provide adequate fire-fighting facilities at a filling station or other places referred to in sub-regulation (1).

56. A developer shall not use a road tanker transporting any corrosive liquid to tow any other vehicle.

Prohibition of towing

57. (1) Where any inflammable or combustible solid is stored at any place, the following conditions shall apply;

Storage of inflammable or combustible solid

(a) adequate precautions shall be taken to prevent spontaneous combustion or self-ignition;

(b) sufficient ventilation shall be provided to dilute spontaneous combustion or self-ignition;

(c) incompatible solids shall be stored apart;

(d) suitable fire-fighting equipment shall be provided; and

(e) a notice bearing the following inscription: "NO SMOKING", "NO NAKED LIGHTS" and "NO FIRES" shall be prominently displayed at suitable places.

(2) Any inflammable and combustible solids shall be stored in a safe and suitable manner at a safe distance from any explosives, magazine, storage box or shaft.

(3) Notwithstanding sub-regulation (2), an inflammable or combustible material awaiting transportation underground may be temporarily stored at the shaft bank if suitable precautions are taken to prevent danger from fire.

58. A person shall not touch or move any container or vessel containing any hazardous material which is leaking until a competent person has personally examined the container and has given instructions on the action to be taken.

Prohibition of touching or moving damaged

container

59. (1) Where any repair is to be undertaken inside any vessel or mobile container which contains any hazardous material, the following procedure shall be followed: Repairs to mobile container

(a) the mobile container or vessel shall be opened and thoroughly ventilate before any repairs are undertaken;

(b) a suitable sampling apparatus shall be used to determine the level of any concentration of gas, vapour or fumes in the container;

(c) a person shall not enter the vessel or mobile container until it is safe to do so;

(d) a competent person, who has personally examined the vessel or mobile container and who is satisfied that it is safe to do so, shall certify that repairs be undertaken specifying-

(i) the repairs to be undertaken;

(ii) the manner in which such repairs shall be undertaken; and

(iii) the precautions to be observed;

(e) where the container contains inflammable, combustible or toxic liquid, it shall be purged; and

(f) where any scale or sludge is to be removed, the repairs shall only be undertaken with suitable non-ferrous tools.

(2) Where any repair is to be carried out on the outside of any tank or mobile container, suitable precautions shall be taken to ensure that no person is endangered while conducting such repairs.

60. Where any repairs have to be carried out on any bowser which contains a hazardous liquid, the provisions of regulation 59 shall apply. Repairs to bowser

61. Where any repairs have to be carried out on any vessel which Repairs to

contains hazardous material, the provisions of regulation 59 shall apply before any person enters the container. vessel

62. The provisions of the Ionising Radiation Act shall apply to any place in which ionising radiation or any radio-active substance is present. Ionising radiation
Cap. 311

PART VII

INSPECTION

63. (1) The Director shall appoint authorised persons in accordance with the provisions of section *eighty-three* of the Act. Inspection of mining operations

(2) The Director shall issue an identity card set out in the Tenth Schedule to each authorised person.

(3) Any person who obstructs the Director in the performance of his duties under this Part shall be guilty of an offence.

64. (1) An authorised person shall have powers, on production of the identity card issued to him under regulation 63, to inspect any mining operation and conduct such inquiries and tests to ensure that the provisions of the Act and these Regulations are being complied with. Power of authorised person

(2) In inspecting any mining operation referred to in sub-regulation (1), an authorised person shall ensure that the mining operation does not have a severe impact on the environment and the records kept are in accordance with the provisions of these Regulations.

(3) The mining operations and records referred to in sub-regulation (2), shall not apply to proprietary information.

(4) An authorised person shall furnish the Director with such reports and such other information relating to the matters referred to in

sub-regulation (2) as the Director may direct.

PART VIII

THE ENVIRONMENTAL PROTECTION FUND

65. (1) A developer shall contribute to the fund established under the Act. Contribution to Fund

(2) The contributions referred to in sub-regulation (1), shall depend on the capacity of the developer to rehabilitate the mining operations that may have an adverse impact on the environment, as may be determined by the Director.

(3) A person referred to in sub-regulation (2), shall apply for a refund of his contribution, less the monies owed to Government as provided for under the Act, if a mine site is declared closed.

66. (1) The contributions to the Fund referred to in regulation 65, shall be calculated depending on the performance of each developer, and shall be categorised as set out in the Eleventh Schedule Fund contributions

(2) The Director shall inform the developer of the category in which the prospecting, exploration or mining operation shall fall and the contribution to the fund using the Form as set out in the Third Schedule.

(3) The contribution shall be deposited with the Fund over a period of five years beginning the year the prospecting, exploration or mining operations are commissioned in the case of new operations, or when the developer submits an approved environmental impact statement in the case of existing mines or project briefs for prospecting and exploration projects.

(4) A new prospecting, exploration or mining operation shall not be

classified in category 1 of the Eleventh Schedule.

(5) A developer who is aggrieved by any decision made under this regulation, may appeal against such decision in accordance with, and as provided for, under section *ninety-five* of the Act.

67. The Director may give concessions to a developer after assessing- Concessions by Director

(a) the approved environment impact statement of new or existing mining, prospecting or exploration operations,

(b) the annual audit report on the environment submitted to the Director; and

(c) any inspection or investigation that the Director may consider necessary for environmental audit report purposes.

PART IX

MISCELLANEOUS

68. Except for any proprietary information, the public shall have access to projects briefs, environmental impact statements, comments made by the public hearing reports kept by the Director. Public access to information

69. (1) A developer shall provide appropriate protective clothing to any employee exposed to any pollutant from a mining process or the environment which may cause injury or impairment to the function of the body of such employee. Protective clothing

(2) An employee to whom personal protective clothing is provided under sub-regulation (1), shall maintain such clothing in a sanitary and proper condition.

70. A developer who operates a mine, where any toxic substance is Provisions of

handled, processed or stored, shall provide-

washing and eating facilities where toxic substances are handled

(a) adequate washing facilities to be used by these employees at the end of each shift; and

(b) adequate facilities immediately adjacent to the washing facilities established under paragraph (a), where such employees shall eat during working hours.

71. A developer shall issue an appropriate code of safe working practice for use by all the employees who work in hazardous conditions, to ensure, as far as is reasonably practicable, the safety and health of his employees.

Code of safe working practice

72. A developer who makes, or causes any other person to make, an excavation into which a person or animal may fall, shall make a regular ridge around the boundary of the excavation or take such other measures as are necessary for the safety or health of such person or animal.

Protection at surface excavation

73. (1) Where any mining operation has caused or is likely to cause any crack, subsidence or cavity on the surface in any area, the whole of the area shall be kept fenced or bounded and shall be a caving area and sufficient notices prohibiting unauthorised entry to the area shall be prominently displayed at suitable places along the fence or bounds.

Crack, subsidence or cavity

(2) No person shall carry out any mining operations likely to cause any crack, subsidence or cavity on the surface within a horizontal distance of one hundred metres from any building, road, railway, lake, river, or any other structure or feature on the surface requiring protection, unless written permission is obtained from the Director, under such conditions as he may prescribe.

(3) No person shall erect or construct a building, power line, road or railway within one hundred metres from the line of break of a caving area, except with the written permission of the Director.

(4) No person shall deposit tailings or other fluid material at any place on the surface of a mine, without the prior approval in writing of the Director.

(5) No person shall enter any caving area, except for the purpose of performing statutory duties.

75. A dump which may cause spontaneous combustion, shall be situated in such a position that it may not cause fire and shall not-

Danger from
spontaneous
combustion

(a) be a danger to any person;

(b) damage any mine shaft, open pit mine, quarry or building; or

(c) pollute the environment.

74. (1) Any person who contravenes any provisions under these Regulations shall be guilty of an offence and shall be liable upon conviction to a fine not exceeding twenty thousand penalty units or to imprisonment for a term not exceeding two years or to both.

General penalty

(2) If the offence referred to in subsection (1) is committed by a company, each person who is a director or is a person in-charge of that mine shall be guilty of that offence, if it was committed with his knowledge.

FIRST SCHEDULE

(Regulation 3)

INFORMATION TO BE CONTAINED IN ENVIRONMENTAL PROJECT BRIEF

1. Name of developer
2. Address of developer
3. Telephone number of developer
4. Fax numbers and electronic mail address
5. Name of owner of mine
6. Mine manager or the person responsible for mine
7. Prospecting permit or mining right or licence number
8. Regional setting:
 - (a) plan or aerial photograph required;
 - (b) topography (Plan required);
 - (c) surface infrastructure (such as roads, railway lines and power lines in the vicinity).
9. A brief description of the regional climate:
 - (a) mean monthly and annual rainfall for the site;
 - (b) mean monthly maximum and minimum temperatures;
 - (c) mean monthly wind direction and speed-where appropriate (such as in urban areas and if such information is freely available);
 - (d) mean monthly evaporation; and
 - (e) incidence of extreme weather conditions-floods, drought, high winds.
10. Soil:
 - (a) plan required;
 - (b) a description of the soil types to be disturbed, their fertility, erodibility and depth;
 - (c) pre-mining land use (proportions of the land used as arable land, grazing land, wetland, and wilderness land, and existing structures and any evidence of misuse).
11. Natural vegetation or plant life
12. Animal life:

Presence of rare or endangered species.
13. Surface Water:
 - (a) plan required;
 - (b) the presence of water course, streams, rivers, dams, and pans should be indicated; and
 - (c) surface water quality.
14. Groundwater (information readily available):
 - (a) depth of water-table, presence of water boreholes; and springs (plan required); and
 - (b) groundwater quality and use.
15. Air quality
16. Noise
17. Sites of archaeological and cultural interest (plan required)
18. Sensitive landscapes
19. Visual aspects
20. Regional socio-economic structure (does not apply for prospecting)
21. Interested and affected parties:

Identify and list known bodies representing interested and affected parties.

22. Geology:

- (a) representative logs, and where appropriate, a section through the orebody and surface mapping;
- (b) identify and characterise overburden material that will be disturbed, may give rise to a deterioration in water quality; and
- (c) presence of dykes, sills and faults that extend beyond the property boundary (plan required).

23. Mineral Deposit:

- (a) mine product(s); including solid, liquid and gaseous waste generation; and noise, heat and radioactive emissions, from normal and emergency operation; or prospecting target mineral(s);
- (b) estimated reserves or extent of target area;
- (c) proposed prospecting or mining method(s) (e.g. opencast, underground, long wall, extensions to existing mine, etc.); and
- (d) planned production rate; planned life of mine or duration of prospecting.

24. Environmental Impact:

- (a) the expected environmental impact of the mining operation;
- (b) the expected area of land and water that may be affected;
- (c) a description of measures to be taken on pollution and any monitoring programmes to be implemented.

25. Mining Operation Project Motivation:

- (a) a brief summary of the motivation for the mining operation; where it is intended that the product(s) shall be sold;
- (b) an estimate of the expenditure required to bring the mining operation into production;
- (c) an estimate of the total annual expenditure at full production;
- (d) an estimate of the labour force during construction at full production; and
- (e) an estimate of the multiplier effect on the local regional and national economy.

26. Mining Operation Alternatives:

- (a) a brief summary of considered mining operation alternatives;
- (b) mining methods;
- (c) mineral processing method;
- (d) transport;
- (e) power and water supply routes;
- (f) sources of water;
- (g) mine infrastructure sites;
- (h) mine disposal sites;
- (i) domestic and industrial water disposal sites;
- (j) housing sites;
- (k) land use options after rehabilitation;
- (l) alternatives to river diversions; and
- (m) the "No mining operation" option.

SECOND SCHEDULE

(Regulation 4)

CONTENTS OF ENVIRONMENTAL IMPACT STATEMENT

1. A detailed description of the proposed prospecting, exploration or mining operation.
2. An estimate of the expected impact of the prospecting, exploration or mining operation on the environment.
3. The procedure to be used to either prevent, minimise or rehabilitate the adverse environmental impact.
4. The proposed environmental management procedures shall be specified and shall include an adequate monitoring and reporting system, which shall incorporate the provisions of the Environmental Protection and Pollution Control Act.
5. Surface infrastructure:
Surface infrastructure (plan required), to include:
 - (a) Roads, railways and power-lines;
 - (b) Solid waste management facilities including industrial and domestic waste disposal sites; mine residue disposal sites (state or show on the plan, the type of residue, final extent of the dumps, construction method and water reticulation layout);
 - (c) Water pollution management facilities, including:
 - (i) sewerage plant location, its design capacity and the process to be used;
 - (ii) pollution control dams, dumps, paddocks and evaporation dams (indicate whether these are to be lined or not); and
 - (iii) polluted water treatment facility, its design capacity and the process to be used;
 - (d) Portable waterplant, location, its design, capacity and the process to be used;
 - (e) Process water supply system, its design, capacity and the process to be used;
 - (f) Mineral processing plant;
 - (g) Workshops, administration and other buildings;
 - (h) Housing, recreation and other employee facilities;
 - (i) Transport;
 - (j) Water balance diagram right across the minesite (the diagram should show the water supply source(s), the water discharge point(s), the evaporation areas and potential seepage points. Each step in the diagram should indicate the estimated flow, in cubic metres per day, into and out of the facility, whether it is pumped or gravity fed, piped or an open channel flow, clean or dirty water and, where appropriate, e.g. in the case of dams, the storage capacity); and
 - (k) Disturbances of water courses.
6. Storm-water:
(Indicate on a plan the storm water diversion measures designed to separate clean from contaminated water);
7. Geology
8. Topography:
(Plan required of expected post-mining topography. Include what slopes will be created during rehabilitation and dump construction).
9. Soils:
(Include depths of soil that will be disturbed and how fertility and erosion will be managed);
10. Land capability:
(Plan required of expected post-mining land capability), and use-(include what type of land use is planned).
11. Natural vegetation or plant life:
(For river and stream diversions emphasise aquatic plant life. If possible, include a description of the plant life that will be used during rehabilitation and how the vegetation will be managed).
12. Animal life:
For river and stream diversions, emphasise aquatic animal life.
13. Surface water:
Indicate the strategies for managing the following:

- (a) the water balance;
- (b) storm water;
- (c) surface rehabilitation (in so far as this affects surface water);
- (d) the legitimate requirement of surface water users on the affected water course;
- (e) for river and stream diversions only-(include how the significant impacts identified will be managed, paying particular attention to erosion control, structural stability and surface drainage into and out of the diverted section).

14. Groundwater:

Indicate the strategies for the following:

- (a) optimising surface rehabilitation in order to minimise adverse groundwater impacts;
- (b) meeting the requirements of legitimate ground-water users in the affected zone.

15. Air quality:

Include an air pollution control plan if the assessment reveals significant potential impacts on air quality at potential impact sites.

16. Noise:

Include a noise reduction plan if significant impacts are expected at receptor sites.

17. Sites of archaeological and cultural interests

18. Sensitive landscapes

19. Visual aspects

20. Regional socio-economic structure

22. Submission of information:

The developer shall establish the extent to which information on measure taken to comply with statutory requirements are to be submitted. The provisions of the Environmental Protection and Pollution Control Act relating to gaseous and effluent emissions will apply as well as the requirements under these Regulations.

23. Maintenance:

Some of the measures will require maintenance after they have been implemented until the time decommissioning and closure activities begin. The developer should consider, where appropriate, the maintenance of at least the following:

- (a) rehabilitated land;
- (b) water pollution control structures; and
- (c) rehabilitated dumps, residue deposits.

THIRD SCHEDULE

(Regulations 5 and 66)

THE REHABILITATION COSTS ESTIMATE

The rehabilitation cost estimate submitted by the developer shall be lodged as a cash contribution with the Environmental Protection Fund established under the Act over a period of five years beginning in the year mining operation is commissioned. For new projects, a submission of an acceptable environmental management plan in the case of existing mines, at the rate of twenty percentum of the total cost each year. If a mining operation lasts less than five years, the cash contribution rate shall be on a *pro-rata* basis. There shall be concessions given against the full cash contribution to be submitted to the Fund which will depend upon the mining operations environmental performance rating as follows:

<i>Category</i>	<i>Concession</i>
1.	95% off full rehabilitation cost
2.	90% off full rehabilitation cost
3.	80% off full rehabilitation cost

The levy concessions shall be such that a developer contributes successively decreasing amounts of money to the Fund over the five year implementation period depending on how quickly the project moves from environmental category 3 to 1. However, this means that the minimum cash contribution that a project can submit to the fund is 5% of the total mine site rehabilitation cost as estimated by the developer. New projects can upon demonstration of capability be rated as Category 2 and then work towards achieving Category 1 status. This contribution shall be calculated against concluding closure costs only and will exclude progressive rehabilitation costs.

ITEMISED REHABILITATION

REHABILITATION COST ESTIMATES

<i>Surface Treatment</i>	<i>Estimated Cost (K/ha)</i>	<i>Area(ha)</i>	<i>Cost(K)</i>
1. <i>Plough, seed, fertilise, construct Graded banks, plant area, roadways spoil</i>			
2. <i>Profiling of spoil for topsoil spreading</i>			
3. <i>Pick-up, transport 100 m, spread Topsoil per 300 mm</i>			

FOURTH SCHEDULE

(Regulation 11)

CONTENTS OF REPORT TO DIRECTOR BEFORE DUMPING

1. The intended total amount of material to be dumped.
2. The average amount of material to be dumped.
3. The chemical composition of the material.
4. The intended dumping method.
5. The details of the site preparation, drainage and foundation.
6. Plans of the proposed dump to a scale of not less than 1/2500 and a section to a scale of not less than 1/1250 or to such larger scale as the Director may in writing approve.
7. The records of the design of the dump.
8. The intended area, height and contour of the boundaries of the dump.
9. The position and the nature of the construction of any wall or other structure.
10. The design and structure of the spillway and the type of material to be deposited there.
11. The nature and extent of inspection, supervision and safety measures necessary during any dumping operations.
12. The details of measures intended to prevent pollution including information on-
 - (a) surface hydrology;
 - (b) existing surface water quality;
 - (c) riverbed sediment;
 - (d) ground water hydrology and ground water quality, where applicable;
 - (e) the extent and location of any ground water aquifers relative to the selected disposal site and how they are to be protected from pollution;
 - (f) the monitoring system to be used;
 - (g) the chemical composition of the material to be deposited which shall be evaluated;
 - (h) the mineralogy of the selected site to determine the potential of acid mine drainage.

N.B. The environment impact statement provided under regulation 6 shall be attached.

FIFTH SCHEDULE

(Regulation 22)

CONTENTS OF DECOMMISSIONING AND CLOSURE PLAN

- 1.** Reasons for closure.
- 2.** Infrastructure:
 - (a) demolition of structures buildings foundations and removal of debris;
 - (b) rehabilitation of the surface according to section *seventy-six* of the Act.
- 3.** Mine dumps and residue deposits:
 - (a) disposal facilities like pipes, solution, trenches, return water dams, etc;
 - (b) ongoing seepage, control of rain water;
 - (c) long-term physical and chemical stability; and
 - (d) final rehabilitation in respect of erosion and dust control.
- 4.** Sealing of underground mining operation:
rehabilitation of dangerous excavations.
- 5.** Progress report of decommissioning:
A developer shall submit to the Director, annually, the progress of the decommissioning of the mining operating until the area is declared closed by the Director.
- 6.** Maintenance-A decommissioned site which requires maintenance until closure is approved by the Director, shall be maintained by the developer by-
 - (a) rehabilitating the land;
 - (b) Controlling water pollution; and
 - (c) rehabilitating residue deposits.

SIXTH SCHEDULE

(Regulation 25)

MAXIMUM PERMITTED QUANTITIES OF CERTAIN GASES IN AMBIENT AIR

Description of gas	Maximum permitted quantity of gas in mg/m ³
1. Hydrogen sulphide	14

SEVENTH SCHEDULE

(Regulation 32)

Table 1: GUIDELINE VALUES FOR HEALTH RELATED INORGANIC CONSTITUENTS IN DRINKING WATER (WHO, 1993)

Constituent	Guideline Values (mg/L)
Arsenic	0.01
Cadmium	0.003
Chromium	0.05
Cyanide	0.07
Fluoride	1.5
Lead	0.01
Mercury	0.001
Nitrate (as N)	10.00
Selenium	0.01

Table 2: GUIDELINE LEVELS FOR CHEMICAL CONSTITUENTS AND PHYSICAL CHARACTERISTICS THAT MAY AFFECT THE AESTHETIC QUALITY OF DRINKING WATER (WHO, 1993)

Constituent Characteristic	Guideline Value
Aluminium	0.2mg
Chloride	250 mg C/litre
Colour	15 True Colour units
Copper	1.0 mg/L
Hardness	500 mg/L as CaCO ³
Hydrogen Sulphide	0.05 mg/L
Iron	0.3 mg/L
Manganese	0.01 mg/L
pH	6.5-8.5
Sodium	200 mg/L
Solids - total Dissolved	250 mg/L
Sulphate	Not offensive for most consumers
Taste and Colour	5 Nephelometric turbidity units preferably
Turbidity	<1 disinfectant efficiency
Zinc	3.0 mg/L

EIGHTH SCHEDULE

(Regulation 40)

CONDITIONS FOR STORING HAZARDOUS LIQUID

1. Every vessel shall-

- (a) contain two suitable manholes, handholes or other means which will allow the interior to be thoroughly cleaned and inspected;
- (b) have safe means of access by any person to any part of the vessel;
- (c) have a vent not less than fifty millimetres in diameter fixed to each vessel and adequately protected by two wire gauze diaphragms, that do not corrode and which has a linear aperture of not less than 0.4 millimetres or more than 0.6 millimetres and diaphragms shall be spaced not less than seventy-five millimetres apart;
- (d) have a vent at the open end facing downwards at least three metres above ground level and not within three metres from any door, chimney or exhaust pipe;
- (e) be earthed as defined in the electricity provisions of the Mining Regulations, and the resistance of any connection shall not exceed five ohms;
- (f) be equipped with filling pipes, extending below the level of the suction pipe with a screwed metal connection to the source of supply;
- (g) have, prominently displayed at suitable places, notices bearing the following inscription: "NO SMOKING", "NO FIRES" and "NO NAKED LIGHTS";
- (h) be placed reasonably free from corrosive ground water or effluent or be treated with anti-corrosive materials; and
- (i) be equipped so that the volume of liquid contained in that vessel may be accurately ascertained.

2. The provisions of paragraph (c), (d), (e), (f), (g), (h), (i) and (j) of sub paragraph 1 shall apply to a vessel which is buried and contains petrol or fuel-oil.

3. A buried vessel referred to in sub-paragraph 1 shall be-

- (a) covered with reinforced concrete to a thickness of not less than one hundred and sixty millimetres;
- (b) be suitably protected; and
- (c) filled through oil-tight pipes fitted with screwed pipes or valves.

4. The provisions of paragraph 1 shall apply to any vessel in which petrol or fuel-oil is stored on the surface and is not buried.

5. A vessel referred to in paragraph 4 shall be-

- (a) supported on properly constructed wall surrounded by enclosed walls or impermeable bunds or embankments of sufficient strength, capable of retaining one hundred and ten per cent of the amount of petrol or fuel-oil contained in that vessel or, where more than one vessel is installed, one hundred and ten per cent of the amount of petrol or fuel-oil contained in all the vessels;
- (b) have valves to stop the flow of liquid if any pipe is damaged;
- (c) equipped with suitable discharge pumping equipment which shall be placed outside any enclosed impermeable bunds or embankments and fitted with stop valves; and
- (d) have its lightning protected.

6. The provisions of paragraph 1 shall apply to any vessel in which any corrosive liquid is stored on the surface with the necessary modifications.

7. Where the vessel is not provided with enclosed walls or impermeable bunds or embankments, there shall be provided a suitable and adequate drainage system draining into a soak-pit or settling pond of sufficient size to contain one hundred and twenty per cent of all the liquid into the vessel until that liquid can be neutralized.

8. Where the discharge of the liquid is by means of compressed air or gas, the requirements of pressure vessels as provided for under the Mining Regulations shall apply.

9. The provisions of paragraph 1 shall apply to any underground vessel in which fuel-oil is stored.

10. An underground vessel referred to in paragraph 9 shall be-

- (a) kept in, or adjacent, to a filling station;
- (b) have two means of access if any point within the area in which the tank is situated is in excess of eleven metres away from the entrance on the intake side;

- (c) constructed of non-flammable materials;
- (d) situated in a well ventilated place and the return air shall be directed to a return airway;
- (e) have walls constructed so as to form a liquid-tight joint with the floor, and any openings through the walls not at a height below the maximum volume of the fuel-oil to be stored in it
- (f) positioned on the intake side of the tank and suitable means of extinguishing any fire shall be provided; and
- (g) protected, as far as is reasonably practicable, against accidental damage.

11. The provision of paragraph 1, 2, 3, 4, 5, 6, 7 and 8 shall apply to any vessel in which any hazardous liquid other than petrol, fuel-oil or corrosive liquid is stored.

NINTH SCHEDULE

(Regulation 49)

FUEL OIL

Fuel oil used underground for supplying motive power to diesel engines shall have a sulphur content of not greater than 0.5 per cent by weight and flash-point of not less than 57.0 degrees celsius as measured by the Closed-Tester apparatus detailed by the Institute of Petroleum (IP-34) or the American Society for Testing and Materials (ASTMD-93) test methods. With due allowance for test method repeatability the guaranteed minimum flash-point should never be lower than 51.5 degrees celsius.

If, for refining reasons beyond the control of the suppliers, the flash-point would be lower than the specified value with a fuel of sulphur content of 0.5 per cent by weight or less, then the sulphur content may be increased to a maximum of 1.0 per cent by weight in order to maintain the flash-point above the specified value.

TENTH SCHEDULE

(Regulation 63)

FORMS

FORM MS 1

REPUBLIC OF ZAMBIA

MINES AND MINERALS ACT

Mines and Minerals (Environment Protection and Pollution Control) Regulations

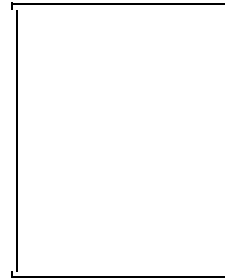
(Regulation 15)

CERTIFICATE OF IDENTITY FOR AN AUTHORISED PERSON

This is to certify that;

.....

has been duly appointed as an authorised person in accordance with section *eighty-three* of the Mines and Minerals Act and section *four* of the Explosives Act.



Signature

Director of Mines Safety

Signature

Bearer

ELEVENTH SCHEDULE

(Regulation 66)

FUND CONTRIBUTIONS

Category 1

Action taken to rehabilitate

- (a) progressive rehabilitation carried out;
- (b) whether rehabilitation has been properly monitored; and
- (c) whether the annual rehabilitation audits show progress to meet the target of the environmental impact statement to manage environmental pollution.

Category 2

Environmental compliance capability

- (a) the financial capability to complete the rehabilitation of the mine area;
- (b) the materials in place for total mine area rehabilitation;
- (c) whether suitable expertise is provided for the organisational structure; and
- (d) whether the developer or the person who holds a mining licence or permit has an approved environmental impact statement or project brief.

Category 3

Basis operational and strategic environmental protection requirements

- (a) an approved environmental impact statement or project brief;
- (b) discharges of mining operations are permitted or licenced;
- (c) post-mining land use and slop and profile design, allowing stable land rehabilitation within the mining or permit area; and
- (d) a water management system is in place or designed to contain, treat, discharge or dispose of contaminated water.