



**WATER AND SEWERAGE AUTHORITY
OF TRINIDAD & TOBAGO**

SAFETY & HEALTH POLICY

VERSION CONTROL

Document Location

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Revision History

Last Revision Date	Version No.	Summary of Changes
17/11/2011	1.0 2008/10/22	Formatted to fit standard policy template. Foreword, purpose, policy objectives, persons affected & table of contents have been added. Original content has not been changed in substance or meaning.

Approvals

This document has been approved by:

Name	Date of Approval	Version
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FOREWORD

The Water and Sewerage Authority engages in several high risk activities as it performs its core function of providing water and wastewater services to the national community. Its products are considered critical for industrial, health, commercial, institutional and domestic use, making it an essential service. An organization of this caliber that strives to deliver excellent performance must be numbered among top performing companies, many of which are multinational. In common with them, **we must also demonstrate excellence in our health and safety performance.**

Core to this policy is the goal of achieving compliance with prevailing national safety regulations, the most fundamental of which is the Occupational Safety and Health Act (OSH Act) of 2004, amended in 2006. This legislation speaks not only to safe industrial practices in the delivery of our service but to the provision of a safe and healthy workplace in which workers must carry out their function in compliance with section 6(7) of the Occupational Safety and Health (Amendment) Act, 2006:

“ An employer of an industrial establishment of twenty-five or more employees, shall prepare or revise, in consultation with the representatives of his employees, a written statement of his general policy with respect to the safety and health of persons employed in the industrial establishment, specifying the organization and arrangements for the time being in force for carrying out that policy and the requirements of subsections (1) to (6A), and the employer shall submit the statement and any revision thereof to the Chief Inspector and bring them to the notice of all persons employed in the industrial establishment”.

In this regard, this Safety and Health Policy was prepared in consultation with, and agreement of the Joint Health and Safety Committee (JHSC) which represented all employees. Since then, the policy has been restructured and reformatted to comply with the organization’s standard policy template and this subsequent version is meant to build on what was already developed.

The Authority will periodically review this policy and associated guidelines/procedures to ensure that they remain relevant and timely.

1.0 PURPOSE

This policy establishes guidelines for safe practices, safety rules and the general tenets governing safety behavior in the Organization. It is meant to provide our employees, contractors and visitors with Health and Safety guidance and outlines our commitment of providing a work environment where safety and health are factored into every task and based on the principle that all injuries and occupational illnesses can be prevented. It provides guidelines for ensuring that the major high risk procedures and practices in the Authority are carried out safely and in compliance with the Occupational Safety and Health (Amendment) Act, 2006 (OSH Act).

2.0 POLICY OBJECTIVES

- i. To declare to all employees, contractors, visitors and the general public, the Authority's commitment to safety in all its activities;
- ii. To clearly outline the roles and responsibilities of all staff, inclusive of the Executive;
- iii. To satisfy an important area of compliance with the OSH Act.

3.0 PERSONS AFFECTED

This policy applies to ALL staff, suppliers, consultants, contractors, other persons onsite who do work on behalf of the Authority as well as visitors.

4.0 POLICY STATEMENT

The Board of Commissioners and Management of the Water and Sewerage Authority are committed to ensuring the safety, health and welfare of its employees, trainees, contractors, visitors and members of the general public who may be affected by its operations.

We are committed to providing a work environment where safety and health are factored into every task, based on the principle that all accidents and occupational illnesses are preventable.

We the **Executive Management**, will:

- ✓ Consistently demonstrate leadership and commitment to the safety, health and welfare of employees;
- ✓ Provide adequate/appropriate resources for the management of the safety, health and welfare of employees;
- ✓ Comply with national legislation, regulations, standards and industry best practices;
- ✓ Develop relevant training programmes in support of this policy;
- ✓ Conduct aggressive health and safety audits and inspections and execute timely and effective remedial action as required;
- ✓ Ensure there is proper communication and consultation on health and safety matters;
- ✓ Achieve hazard and risk control systems through the adoption and/or adaptation of modern designs and effective purchasing policies;
- ✓ Recognize and reward positive health and safety behaviour and performance;
- ✓ Ensure that contractors, consultants and others who provide services on the Authority's behalf comply with all safety and health standards/guidelines.
- ✓ Co-operate with government and non-governmental organizations, industry groups and others involved in safety, health and environmental issues.

The success of this policy hinges on the full co-operation of all employees who are expected to adhere to safe work practices, safety standards and guidelines and are responsible for

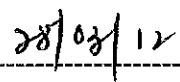
maintaining a safe workplace. Additionally, employees must report all incidents (accidents and near misses) to their supervisors/managers and refrain from misuse, damage or interference with any item/s provided for the purpose of occupational safety and health. It is the principal responsibility of both management and staff at all levels to ensure conformity with all safety standards, procedures and guidelines established in this policy.

The Chief Executive Officer is responsible for the implementation of this policy and will foster an environment of continuous consultation and cooperation between Management and all employees in order to ensure its effectiveness.

This Safety and Health Policy shall be reviewed annually by the Joint Health and Safety Committee (JHSC) to allow for consultation and ensure its continued relevance and effectiveness. Management shall provide the necessary resources to implement this policy and to facilitate the policy reviews.



Chief Executive Officer



Date: yyyy/mm/dd

5.0 ORGANIZATION FOR SAFETY & HEALTH – ROLES & RESPONSIBILITIES

Management, employees and contractors are all responsible for and contribute towards maintaining a safe workplace and as such, are entrusted with specific roles and responsibilities. These roles and responsibilities for both Management and Employees must:

- Complement job descriptions;
- Be defined in their goal plans and performance standards; and
- Contribute towards the overall culture change of the organization.

See Appendix A for detailed Roles and Responsibilities for all levels of Management and Staff.

6.0 GENERAL GUIDELINES

6.1 H&S Training and Orientation

The Authority recognizes the need for education of staff in the area of workplace safety. In particular, new and/or inexperienced employees are more likely to be involved in accidents or get injured and should be adequately trained to prevent the likelihood of such occurrences. As such:

- 6.1.1 Employees are to be trained to deal with the hazards within their environment.
- 6.1.2 Fire Safety and Emergency Evacuation Training are to be undertaken at every manned facility.
- 6.1.3 Managers/Supervisors are responsible for identifying appropriate training required and ensure workers receive such as well as give time off from their job to attend.
- 6.1.4 New employees are to be provided with a copy of the Health and Safety Policy as well as given a proper orientation of the workplace/job site with attention to site specific hazards, emergency procedures, use of PPE and first aid supplies.

- 6.1.5 Where possible, new employees should be partnered with a more experienced one.
- 6.1.6 Safety Training Records and Requirements must be maintained for each employee.
- 6.1.7 It is mandatory for all employees to attend Health and Safety Training identified by the Authority for them.

6.2 Safety Drills

- 6.2.1 Safety drills, such as for fire and evacuation are mandatory and all employees and visitors must participate at the designated time.
- 6.2.2 Employees are required to obey the instructions of fire marshals.
- 6.2.3 All drills will be undertaken in coordination with the respective departmental manager/supervisor.
- 6.2.4 A listing of evacuation procedures, routes and fire marshals shall be established at each floor/office.

6.3 Safety Inspections and Audits

It is the policy of the Authority to maintain a programme of safety inspections. The objective of which is to control hazards in the workplace and ensure safe systems of work. All facilities and active job sites must be included in the inspection programme.

- 6.3.2 Informal inspections are to be conducted supervisors/managers on an ongoing basis in their area(s) of responsibility.
- 6.3.3 Formal inspection/hazard assessment shall be conducted by the Health and Safety Department on a monthly basis.
- 6.3.4 A copy of all inspections done will be provided to the respective line supervisor/manager for remedial action as well as made available to the Joint Health and Safety Committee on request.

- 6.3.5 All supervisors/managers must cooperate and participate in safety inspections/audits.
- 6.3.6 The Health and Safety Department and Joint Health and Safety Committee will monitor progress in eliminating/addressing workplace hazards including workers' complaints and work refusals.

6.4 Personal Protective Equipment (PPE)

- 6.4.1 PPE is provided for employees to help safeguard them against work dangers. It is the responsibility of the Supervisor / Manager to assess and supply employees PPE needs.
- 6.4.2 All personnel are to comply with the Authority's minimum standards for PPE on operational sites (e.g. wastewater and water treatment works, pumping stations, reservoirs, towers, boosters, etc.) and assets (e.g. the water network and sewers, etc.)

(See Appendix B for specific guidelines on Personal Protective Equipment)

6.5 Permits to work

- 6.5.1 Permits to work must be used for the following jobs/tasks:
- a) General / Safe work
 - b) Hot Work
 - c) Vessels/tanks and Confined Space Entry
 - d) Electrical work
 - e) Safe working at Height
 - f) Any other tasks which the H&S Department so determine in its discretion
- 6.5.2 Technical Managers and/or Supervisors are authorized to issue permits. It is the responsibility of the person authorizing a permit to work to ensure that the specified precautions have been taken and isolations have been made and to consult with the designated personnel from the H&S Department.
- 6.5.3 Every person who has responsibility for issuing/authorizing a permit to work must be formally trained in Permit to Work System prior to designation as an issuing authority.

Appropriate structured training with the use of lesson plans and written material will be organized by the Safety Department.

- 6.5.4 Permits can be cancelled for any one of the following reasons:
- a) Failure to comply with Safety rules as stipulated in regulations
 - b) Accidents/Incidents/Near misses
 - c) Emergencies
 - d) Other e.g. changes to the job/task that results in new hazards

(See Appendix C for specific guidelines and procedures for Permits to Work)

6.6 Restricted Areas and Activities

- 6.6.1 All areas designated as restricted are off limits to unauthorized employees and other persons and should be clearly marked.
- 6.6.2 There shall be no smoking in any enclosed area or other restricted areas.

6.7 Signs and Color Codes

- 6.7.1 The British Standard 5378 system will be adopted as a guide for signs and color codes.

(See Appendix D for detailed guidelines on Signs and Color Codes)

6.8 Records and Reports

Reporting an accident, injury or illness is not necessarily an indicator of fault or violation. It is the initiating process in correcting weaknesses or flaws in the Authority's operational systems.

- 6.8.1 The following shall be reported forthwith to the immediate supervisor/manager and the Safety Officer by the quickest possible means:
- a) Any accident causing death or major injury to an employee during the course of his/her duties.
 - b) Any accident, which occurs on the premises of or involving the property of the Authority, causing death or major injury to any member of the public.

- c) Any dangerous occurrence which resulted in injury to person or damage to property or which may have had some probability of resulting in injury to person or damage to property.
 - d) Any work related illness (work related illness must be diagnosed by a physician, nurses allowed to diagnose or other trained personnel).
- 6.8.2 All other accidents, illnesses, injuries and “near misses: must be reported to the supervisor/manager and Safety Officer and documented in a log book
- 6.8.3 A log of all recordable occupational accidents and illnesses must be kept on a calendar year basis at all fixed locations, such as offices, plants, and facilities where employees report for duty. These records must be kept by the supervisor and be available to the Safety Officer on request.
- 6.8.4 The log of such reports must be kept for at least five (5) years.

6.9 First Aid

- 6.9.1 All Employees should be trained in First aid and CPR.
- 6.9.2 Supervisors must ensure that a well-stocked first aid kit is immediately available for his/her subordinates and must maintain a proper record of the contents and dispensing of items within these kits.

See Appendix E, Section 13.1 for First Aid procedures

6.10 Official Visits

- 6.10.1 The relevant Head of Department shall inform the Safety Officer and Chief Security Officer whenever Government or other important Officials wish to visit any section/area of the Authority.
- 6.10.2 The Safety Officer should check such section/area if circumstances permit at least two (2) days prior to such visit and should continue to monitor these measures to ensure that safety measures are taken for the visitor’s safety.

6.11 Pre-Employment Screening

6.11.1 All applicants selected for employment shall be subject to the following –

- a. A physical and medical examination consistent with the job requirements;
- b. Testing in manipulative classes;
- c. Drug testing

6.11.2 No applicant shall be permitted to reschedule any test except where prior approval has been granted by the Authority.


6.11.3 Pursuant to 6.11.2 all applicants who have tested Positive for Drug testing, will undergo further Drug Testing which shall be conducted in accordance with established and recognized testing procedures.

6.11.4 An applicant who returns a positive test on a Second Drug Test will not be hired.

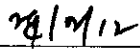
CERTIFICATE OF RESPONSIBILITY

Management commits to create and maintain a strong internal control environment that ensures implementation and adherence to the Authority's policies. It is our responsibility to provide resources, facilitate training, provide ongoing support, disseminate and communicate new and revised policies to all affected parties. As management, we accept responsibility for enforcing all policies and we commit to immediately address all reports or suspicions of policy breaches. This means that we will apply sanctions in a timely manner without regard to designation or seniority.

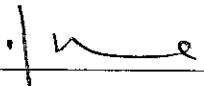
This policy must be adhered to by all members of staff and we will ensure that this policy is revised and updated consistent with changes in business conditions, applicable laws and regulations.




Chief Executive Officer



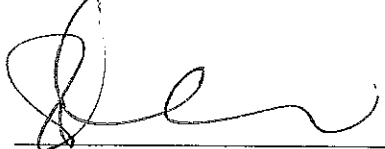
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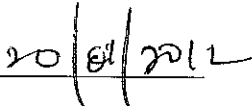
Chief Corporate Officer



Date: dd/mm/yyyy



DGM, HSE Division



Date: dd/mm/yyyy

APPENDICES

Appendix A – Organization for Safety & Health

Appendix B – Personal Protective Equipment (PPE)

Appendix C – Permit to Work

Appendix D – Signs & Color Codes

Appendix E – Workplace Hazards and Associated Guidelines

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 - II Chemical Handling
 - III Cleaning and Waxing in Buildings
 - IV Compressed Gas Systems
 - V Confined Spaces
 - VI Construction
 - VII Falls
 - VIII Fire Protection
 - IX Laboratory Safety
 - X Landscaping and Gardening
 - XI Lifting and Material Handling
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 - XV Motor Vehicles
 - XVI Office Safety
 - XVII Sewerage Works
 - XVIII Stairways
 - XIX Tools
 - XX Use of Ladders
 - XXI Water bodies and Associated Works
 - XXII Workshops
- Appendix F - Definition of Terms

Appendix A – ORGANIZATION FOR SAFETY & HEALTH

1.0 Roles & Responsibilities

1.1 Duties and Responsibilities of the Executive Management

- 1.1.1 Ensure the preparation and implementation of the H&S policy.
- 1.1.2 Provide adequate and appropriate resources to meet requirements of H&S Policy.
- 1.1.3 Facilitate the implementation of a Health and Safety Management System.
- 1.1.4 Conduct regular reviews of the safety and health performance of the organization.
- 1.1.5 Develop and review strategies for their respective divisions for successful implementation of the Safety and Health Policy.
- 1.1.6 Use results of risk assessment processes and audits in formulating plans.
- 1.1.7 Set standards of risk reduction in accordance with the safety policy and support safety initiatives through established performance measures.
- 1.1.8 Initiate the development and implementation of Standard Operating Procedures (SOPs) and ensure the adherence to Health and Safety Policies and Procedures.
- 1.1.9 By example and by initiatives, show the importance of a positive safety and health culture.
- 1.1.10 Report all Accidents and Incidents, inclusive of major accidents, minor accidents and near misses to the H&S Manager and JHSC.
- 1.1.11 Ensure compliance with OSH Act

1.2 Duties and Responsibilities of the Line Managers

General:

- 1.2.1 Ensure that copies of the Policy Statement are displayed at all locations where employees are based and ensure that copies of the Safety and Health Policy are provided to all employees, including new recruits.
- 1.2.2 Ensure that updates of policy are discussed with support staff where relevant.
- 1.2.3 Ensure compliance with the Safety and Health Policy and Management System.
- 1.2.4 Identify and make recommendations for the relevant health and safety training for all employees under their care.
- 1.2.5 Establish a system for measuring safety performance and report on this performance as required.
- 1.2.6 Report all Accidents and Incidents, inclusive of major accidents, minor accidents and near misses to the H&S Manager and to the direct supervisor.
- 1.2.7 Participate in accident investigations as required.
- 1.2.8 Ensure that budgetary allocations for all safety related activities (eg. Training, PPE, safety guards, safety signage & corrective actions coming out of safety inspections and risk assessments) are made.
- 1.2.9 Show by example and encouragement, belief in and benefits of, a positive safety and health culture.
- 1.2.10 Cooperate with internal and external auditors in assessing the status of safety performance.
- 1.2.11 Consider and include safety and health aspects of all activities.

Where specific to his/her roles and responsibilities:

- 1.2.12 Carry out inspections to verify compliance with safety standards and recommendations made by the safety department

- 1.2.13 Perform periodic checks to ensure adherence to Standard Operating Procedures (SOPs)
- 1.2.14 Ensure that Job Safety Analyses and Risk Assessments are performed.

1.3 Duties and Responsibilities of Supervisors

General

- 1.3.1 Ensure that updates of policy are discussed with employees (where relevant) and queries addressed.
- 1.3.2 Participate in risk assessment exercises
- 1.3.3 Carry out regular inspections of the work environment to ensure adherence to good housekeeping practices and safety requirements.
- 1.3.4 Ensure that subordinates are conversant with appropriate policies and understand their duties in respect of compliance.
- 1.3.5 Ensure that subordinates have appropriate skills identified by training matrix.
- 1.3.6 Complete audit documentation and report results.
- 1.3.7 Ensure subordinates understand the importance of, and commitment to, safety and health. Set positive examples and correct improper behavior.
- 1.3.8 Involve subordinates in safety and health planning, review and auditing.

Where specific to his/her roles and responsibilities:

- 1.3.9 Implement systems and provide data to risk assessment process.
- 1.3.10 Measure safety and health performance, including initial accident investigation.
- 1.3.11 Perform inspections of special equipment used to ensure that they are in proper working condition and in compliance with the statutory requirements of the OSH Act.
- 1.3.12 Ensure that toolbox meetings are held regularly and properly documented and that feedback on incidents and accidents are made to persons under their supervision.

- 1.3.13 Perform Job Safety Analysis.
- 1.3.14 Report all Accidents and Incidents, inclusive of major accidents, minor accidents and near misses to the H&S Manager and to the direct Line Manager]

1.4 Duties and Responsibilities of Employees

General

- 1.4.1 Adhere to good housekeeping practices to ensure their work area is kept in a safe and tidy condition.
- 1.4.2 Adhere to the Authority's safe work procedures, practices and instructions.
- 1.4.3 Immediately report any unsafe work practices/equipment/conditions to their Supervisor/Manager.
- 1.4.4 Immediately report all incidents, inclusive of major accidents, minor accidents and or near misses, to their Supervisor/Manager.
- 1.4.5 Refrain from the misuse, damage or interference with any features provided by the employer for the purposes of occupational safety and health at the workplace.
- 1.4.6 Perform all duties in a manner that promotes safety and health for everyone and which does not expose fellow workers to unnecessary risk.

Where specific to his/her roles and responsibilities:

- 1.4.7 Wear and ensure proper care for PPE issued.
- 1.4.8 Inspect PPE issued regularly and report the need for replacement to supervisor.

1.5 Duties and Responsibilities of the Joint Health & Safety Committee (JHSC)

- 1.5.1 Review and revise WASA's Safety and Health policy
- 1.5.2 Work collaboratively with management in the interest of health and safety.

- 1.5.3 Keep under review the measures taken to ensure the safety and health of persons at the place of work.
- 1.5.4 Investigate and take appropriate action on safety and health issues at WASA e.g. refusal to work, accident investigations, ensuring corrective/remedial action, etc.
- 1.5.5 Work proactively to ensure the Health and Safety policy is disseminated and implemented.
- 1.5.6 Establish Sub-Committees and Location Committees where relevant and guide and monitor their activities.
- 1.5.7 Establish a means of communication so that workers can bring to light potential safety and health hazards and/or make suggestions for appropriate measures to address any safety and health issue.
- 1.5.8 Actively promote and adopt a positive attitude to safety and health in the Authority.
- 1.5.9 Show by example and encouragement belief in, and benefits of, a positive safety and health culture.

1.6 Duties and Responsibilities of the Health & Safety Manager

- 1.6.1 Co-ordinate inspections of plants, tools, equipment, facilities and systems of work to ascertain compliance with established standards and practices.
- 1.6.2 Provide professional advice on the objectives, organization and arrangements of the Safety and Health Policy.
- 1.6.3 Provide support for risk assessment teams.
- 1.6.4 Analyze accident data and establish a system of regular reporting.
- 1.6.5 Advise on best safety practices with respect to day to day activities.
- 1.6.6 Carry out accident investigation, reporting and analysis.

- 1.6.7 Take appropriate action to prevent any work activity that compromises the health and safety of employees, the public and visitors or poses a threat to the safety and security of property.
- 1.6.8 Represent the Authority in liaising with external agencies/companies on safety and health matters.
- 1.6.9 Advise on measures employed in the management of safety and health initiatives within the Authority such as performance standards, etc.
- 1.6.10 Advise on suitable safety and health training for all levels of employees and execute this training where possible.
- 1.6.11 Provide safety input in the planning and execution stages of projects and high risk activities.
- 1.6.12 Develop strategic policies, procedures and guidelines for high risk activities and practices.
- 1.6.13 Monitor and report on trends in safety performance and take appropriate action where required.
- 1.6.14 Participate in and monitor compliance with the implementation of safe systems of work.
- 1.6.15 Act in an advisory capacity to the Joint Health and Safety Committee.
- 1.6.16 Actively promote the development of a positive safety and health culture and show by example and encouragement belief in, and benefits of the same.
- 1.6.17 Advise on the establishment and maintenance of Health and Safety Management Systems with the attendant competency matrices.

1.7 Duties and Responsibilities of Contractors

- 1.7.1 All contractors, persons or firms to whom tenders and contracts are awarded, shall comply with WASA's Safety and Health Policy and all relevant laws of Trinidad and Tobago
- 1.7.2 Provide inspection certificates for equipment used.
- 1.7.3 Provide for all jobs documentation of risk assessments, as well as job safety analyses, work outline (method statement) or any other records regarding their Health, Safety and Environmental Capability that may be requested.
- 1.7.4 Must have and submit to WASA their HSE Manual

Appendix B – PERSONAL PROTECTIVE EQUIPMENT (PPE)

1.0 Use of PPE

1.1 General

- 1.1.1 PPE must be worn where there is a reasonable probability of injury or illness, which can be prevented by such equipment.
- 1.1.2 The provision of all protective equipment shall be the responsibility of the supervisor who will consult with the Safety Officer on the suitability of the equipment.
- 1.1.3 Clothing worn must not endanger safety and must be suitable for the work being performed, e.g.:
- 1.1.4 (a) Shirt tails must be tucked in; and
- 1.1.5 (b) Long sleeves must be buttoned.
- 1.1.6 Jewellery, such as rings, chains, watches, earrings, etc., must not be worn when working with moving machinery.
- 1.1.7 Warning signs shall be posted on machines and work areas where PPE is required.
- 1.1.8 No person shall:
- 1.1.9 (a) Enter a hazardous environment without the prescribed ppe .
- 1.1.10 (b) Use poorly fitted equipment;
- 1.1.11 (c) Remove equipment while in the hazardous environment or remain in the hazardous area with damaged or faulty equipment.
- 1.1.12 All persons using PPE must be familiar with the capabilities, limitations, proper methods of fitting, testing, using and caring for PPE.
- 1.1.13 Supervisors shall schedule practice sessions or have training sessions conducted to maintain user efficiency.

1.2 Eye protection

- 1.2.1 Eye Protection should be worn when:
- 1.2.2 Drilling or chipping stone, brick or masonry and breaking concrete or pavement by hand tools.
- 1.2.3 Working around high speed grinding wheels;
- 1.2.4 Welding, cutting and brazing;
- 1.2.5 Working under motor vehicles;
- 1.2.6 Cleaning operations using compressed air or sand blasting;
- 1.2.7 Working in heavy underbrush or trees;
- 1.2.8 Working with batteries, e.g. testing cells and jump starting;
- 1.2.9 Sawing metal and wood;
- 1.2.10 When working with chemicals in laboratory

1.3 Foot protection

- 1.3.1 Protective footwear should be worn:
- 1.3.2 When opening and closing manholes
- 1.3.3 On construction sites.
- 1.3.4 When working in mud or water.
- 1.3.5 When operating pavement breakers, tampers, impact tools.
- 1.3.6 Whenever considered necessary by the Safety Officer or supervisor.
- 1.3.7 Employees should not wear slippers, open toe shoes or any other type of footwear, which may cause the wearer to slip easily or expose them to other unnecessary hazards.

1.4 Hand protection

- 1.4.1 Persons required to work with a liquid other than water shall wear gloves impervious to such liquids and of sufficient length to prevent entrance into the top of the gloves.
- 1.4.2 Gloves shall be worn when there is reasonable probability of damage to the hand from heat, abrasions or crushing.

1.5 Head protection

- 1.5.1 Head protection is required when there is reasonable probability to impact and /or penetration from falling and flying objects, electrical shock and /or burns.
- 1.5.2 Safety headgear must be worn when:
 - a. Working in the vicinity of construction equipment, such as derricks and booms.
 - b. Worker is at a lower level than the works being performed, such as in trenching.
 - c. On construction sites.
 - d. Entering and leaving manholes.
 - e. Performing work on ladders, aerial platforms and lifts.
- 1.5.3 Hair reaching below a regular shirt collar should be restrained with a hair net or other appropriate means when working around any type of machinery.
- 1.5.4 The shell and suspension of hard hats shall be inspected and cleaned regularly. The suspension shall be replaced whenever there is a sign of deterioration.
- 1.5.5 Broken or punctured hard hats should be replaced and not repaired.
- 1.5.6 Metal helmets shall not be used around electrical hazards.
- 1.5.7 Hardhats must not be used as a seat or thrown about.
- 1.5.8 Nothing should be placed inside protective head gear unless advised by the Health and Safety Manager.
- 1.5.9 The manufacture's guidelines must be consulted before the shell of any headgear is painted especially dielectric shell types.

1.5.10 Safety hats must not be placed against the back glass of any vehicle.

1.6 Hearing protection

1.6.1 Employees must wear hearing protection when noise levels during an eight-hour workday are above 85 dBA or when higher levels exist at shorter periods as specified by the Safety Officer. The recommended ceiling level shall be 115 dBA.

1.7 Respiratory protection

1.7.1 In the absence of adequate engineering controls, employees shall wear the correct respiratory equipment to protect them against breathing air contaminated with harmful dust, fogs, fumes, mists, gases, smoke, spray or vapors, in excess of ACGIH Threshold Limit Values.

1.7.2 Respiratory equipment shall be used in accordance with instruction and training.

1.7.3 The medical status of respirator users shall be reviewed annually.

1.7.4 Tasks that require the use of a breathing apparatus shall not be assigned to any person who is not physically fit to perform with or use such apparatus.

1.7.5 All respirators must be inspected before and after use.

1.7.6 Self Contained Breathing Apparatus (SCBA) must be inspected monthly by supervisory personnel and a record kept of the inspection date and findings.

1.7.7 Contact lenses must not be worn while using gas masks.

Appendix C – PERMIT TO WORK

1.0 PERMIT TO WORK

1.1 General

1.1.1 Permits to work form an essential part of safe systems of work for various types of high-risk tasks, many of which are concerned with maintenance work, engineering work, or cleaning operations. Such permits are documents which:

- a) Specify the work to be done and the person authorized to do it, as well as the potential hazards.
- b) Assess the potential hazards, define safe procedures and specify the precautions to be taken.
- c) Indicate whether the task to be undertaken is a critical task.
- d) Allow the work to start only after safe working procedures have been implemented.
- e) Provide a clear record that all reasonably foreseeable hazards have been considered and the necessary precautions taken.
- f) Provide a record that the work has been completed, and the plant or equipment is handed back for its normal use.

1.2 Types of Permits

1.2.1 The types of permits to work used in the plant and the types of activities they cover are outlined below:

- (a) **General/Safe Work Permit** -- *Black writing on White background.*

This permit covers all general work where it is necessary to ensure that all safety precautions are taken before work is started on equipment or in areas, which are considered potentially hazardous.

This does not include work involving flame/spark producing equipment, entry into tanks and vessels or electrical works. Some examples of general work are:

- ❖ Ammonia Systems - Excavation

- ❖ Compressors - Air Distribution System
- ❖ Steam System - UPS
- ❖ Natural Gas System - Fire Suppression
- ❖ Cooling Towers - System
- ❖ All Pipelines - Maintenance Work on Enzyme System
- ❖ Plant and Equipment- Modifications - Pest Control/Eradication
Industrial Cleaning
Unorthodox use of a forklift

(b) **Hot Work Permit – Red writing on white background**

This permit covers all hot work defined as work involving temperature conditions which are likely to cause ignition of combustible gases, vapours or liquids in, or adjacent to, the area involved.

Examples:

Welding, burning, chipping concrete, sand blasting, grinding or any work required naked flames or hot surfaces, power tools and tools likely to give off sparks.

(c) **Vessels/tanks and Confined Space Entry Permit – Black writing on yellow background.**

This permit covers entry into tanks/vessels or confined spaces. This is not a permit to work; it only provides the conditions for safe entry.

NB: *A hot or safe work permit is required with this permit.*

(d) **Electrical permit to work – Blue writing on white background:**

- ❖ Work on all high voltage systems, greater than 3,300volts.
- ❖ Work in involving access to circuit conductors of 300 amps or above.
- ❖ Electrically powered lifting equipment (e.g. Hoist, Lifts).
- ❖ Electrical equipment which are a source of electrical energy e.g. generators.

- (e) **Safe working at Height work permit** – *Black writing on green background:*

The mandatory standard for safe working at heights is applicable to any location, activity or task, where there is a significant risk of a fall of over two (2) meters, or a fall that would result in serious injury, for example, from a hazard below.

Tasks include maintenance, production activity, construction activity and/or demolition activity.

1.3 Permits to work procedures

- 1.3.1 Permits must be issued prior to the commencement of work. Such permits must be displayed at or very near the work location with the exception of confined space/vessel permits, which must be affixed to the tank/vessel/confined space.
- 1.3.2 If an agreed program of work must be changed and additional special precautions are to be taken, then a new permit to work should be issued.
- 1.3.3 The permit is a written document or certificate, which authorizes certain persons to carry out specific work on, specified plant or equipment, within a prescribed time period. It also sets out the main precautions to complete the job safely.
- 1.3.4 The permit must be used for the jobs or tasks defined in Section 1.2 of this manual.
- 1.3.5 Managers and/or Supervisors are authorized to issue permits. It is the responsibility of the person authorizing a permit to work to ensure that the specified precautions have been taken and isolations have been made.
- 1.3.6 All tasks subjected to compulsory site permit to work; require that an assessment of the risks involved and the precautions be carried out by the Manager or Supervisor.
- 1.3.7 The Manager/Supervisor certifies his/her acceptance of the permit to work, by signing this document, after establishing that the precautions and procedures detailed are still in place.

- 1.3.8 He then hands over the permit to work to the person/contractor responsible for the job, who then signs off as having read and checked that all precautions are still in place.
- 1.3.9 All signatures must be legible and dated.
- 1.3.10 On completion of the job the person/contractor who has done the work certifies by signing (in writing) that the work is completed and ready for testing.
- 1.3.11 The person who authorized the permit also signs that the work has been satisfactorily completed after physical inspection of the site.
- 1.3.12 Unless specified otherwise, permits are valid for a maximum period of twelve (12) hours.
- 1.3.13 An existing permit may be extended providing conditions/precautions of issued permits remain unchanged and work does not exceed two (2) hours.
- 1.3.14 All permits are to be issued in triplicate, with one copy to be maintained in a central file in the Health and Safety Department, one copy to be maintained by the issuer of the permit and the original to be displayed at the work site.
- 1.3.15 Every person who has responsibility for issuing/authorizing a permit to work must be formally trained in Permit to Work System prior to designation as an issuing authority. Appropriate structured training with the use of lesson plans and written material will be organized by the Safety department.
- 1.3.16 Any person who authorized a permit has the authority to cancel the permit. In special cases cancellation can be done verbally but follow-up detailed documentation must be completed in 24 hours.

Appendix D - Signs & Color Codes

Definitions according to The British Standard 5378 system:

- **Safety Color** – A color to which a specific Health and Safety meaning or purpose is assigned.
- **Contrasting color** – A color that contrasts with the Health and Safety color in order to make the latter more conspicuous.
- **Symbol** – A pictorial representation used on a Safety sign.
- **Safety Sign** – A sign that gives a message about Health and Safety by a combination of geometric form, safety color and symbol or text (i.e. word, letters, numbers) or both.
- **Prohibition Sign** – A safety sign which indicates that certain behavior is prohibited.
- **Warning Sign** – A safety sign that gives warning of a hazard.
- **Mandatory Sign** – A safety sign that indicates that a specific course of action must be taken.
- **Safety Condition Sign** – A safety sign that provides information about safe conditions.
- **Supplementary Sign** – A sign with text only, that may be used in conjunction with a safety sign, in order to provide additional information.
- **Danger Identification** – if identification is required of places where there is risk of collision, falling, stumbling, falling objects or where there are steps, holes on floors or similar hazards, a combination of fluorescent orange-red or safety color yellow, together with black shall be used. The proportion of yellow or orange-red to black, shall be at least 50%. Danger identification marks can be used with or without a safety sign.

Appendix E - Workplace Hazards and Associated Guidelines

1.0 CHEMICALS

1.1 General

- 1.1.1 Hazardous chemicals not properly stored or labeled must be reported to your supervisor for attention.
- 1.1.2 Any chemical splashed onto the body should be immediately washed off with water. Employees should also know the location of emergency showers and eye wash fountains.
- 1.1.3 Chemical spills must be immediately cleaned. When or if necessary, an evacuation of the area must be implemented.
- 1.1.4 All chemicals entering the premises of the Water and Sewerage Authority must be accompanied by a Material Safety Data Sheet (MSDS), to be kept by the User Department/Section.
- 1.1.5 Employees have the right to know the extent of hazards associated with all chemicals with which they are in contact.
- 1.1.6 All toxic chemicals including insecticides and pesticides must be properly labeled, adequately secured and should be controlled and dispensed only by authorized persons.
- 1.1.7 Persons who handle chemicals should shower after working with them.

1.2 Alum (Al₁ (SO₄)₃ 14H₂O)

- 1.2.1 All spills of alum shall be cleaned up promptly.
- 1.2.2 Respiratory equipment must be worn when cutting and emptying bags.
- 1.2.3 In the event of body contact, wash with plenty of cool water and soap.

1.3 Asbestos

1.3.1 Employees engaged in the removal of asbestos, cutting of AC pipes, handling of structures or equipment covered with asbestos, demolition of asbestos insulation or coverings, or maintenance of vehicle brake system, shall wear appropriate respiratory equipment. Engineering controls as far as is feasible must be implemented to control the airborne concentration of asbestos fibres.

1.4 Carbon

1.4.1 Dust masks shall be worn when handling carbon.

1.4.2 Carbon shall be stored in a clean dry place with access aisles around stacks. Do not make large stacks which are unstable and could create a fire hazard.

1.4.3 Carbon storage areas shall be protected from flammable materials such as oily rags and chlorine compounds.

1.4.4 Smoking is prohibited while handling carbon or in the storage areas.

1.4.5 In the event of a carbon fire:

(a) Do not douse with a large stream of water but use a controlled flow.

(b) Wear self contained breathing apparatus to guard against carbon monoxide poisoning.

1.4.6 Activated carbon absorbs oxygen from its environment. Operations and Maintenance personnel should exercise care in entering a carbon column tank or any enclosed room where carbon is stored. Safety harness and self contained breathing apparatus shall be worn. Two (2) standby personnel must be on hand.

1.5 Chlorine

1.5.1 A sufficient number of masks, cannisters and self-contained breathing apparatus (SCBA) should be available for handling chlorine emergencies.

- 1.5.2 Masks, cannisters and self-contained breathing apparatus must be kept outside the chlorine handling area and be readily accessible. Contact lenses or regular glasses should not be worn with gas masks.
- 1.5.3 Beards or facial hairs do not allow for a proper fit or seal of masks on the face. Employees therefore should be clean-shaven if they are likely to be handling chlorine.
- 1.5.4 Operators should clean their facemasks after use with a mild detergent or soap and water and store them in a cool place.
- 1.5.5 Two (2) trained persons wearing the appropriate masks shall be designated to:
 - 1.5.6 (a) Break any connection
 - 1.5.7 (b) Test new connection; and
 - 1.5.8 (c) Determine the course of leak when there is the possibility of chlorine remaining in the line, valve or connection being repaired.
- 1.5.9 WARNING: When using gas masks leave the contaminated area immediately if:
 - 1.5.10 (a) Breathing becomes difficult
 - 1.5.11 (b) Dizziness or distress occurs
 - 1.5.12 (c) The contaminant is tasted or a smell is detected
- 1.5.13 Chlorine cylinders or drums must not be moved without the protective caps firmly in place.
- 1.5.14 Appropriate foot wear must be worn when moving cylinders and drums.
- 1.5.15 All upright cylinders shall be chained or strapped two-thirds of the way up.
- 1.5.16 A gas mask and breathing apparatus drill should be held at least once per month.
- 1.5.17 Ammonia spray bottles shall be provided for each chlorine room to detect and locate chlorine gas leaks.

1.5.18 Chlorine leaks must receive prompt attention.

1.5.19 Water should not be sprayed on chlorine leaks.

1.5.20 Never trap liquid chlorine in a line between two closed valves.

1.6 Chlorine Detoxification:

1.6.1 General Procedure:

- i. Anyone exposed to chlorine should not panic. He should keep his mouth closed and avoid coughing or breathing deeply.
- ii. In all cases, injured persons must be removed from the contaminated area and medical aid sought if necessary.
- iii. No food or beverage should be given to any unconscious person.

1.6.2 Severe exposure:

- i. Promptly remove any clothing contaminated with chlorine
- ii. Keep the injured person warm and relaxed.
- iii. Place the injured person on his back with his shoulder slightly elevated and the head tilted backward to keep the air passages to the lungs open.

1.6.3 Inhalation:

- i. If the injured person is having trouble with his breathing, give him oxygen if equipment and trained personnel are available.
- ii. If breathing has stopped, begin artificial respiration immediately. Mouth to mouth resuscitation or any other approved method may be used. Administer oxygen if equipment and trained personnel are available and seek immediate medical attention.

1.6.4 Eyes:

- i. Eye irritations, even if mild, should be flushed with water for at least fifteen (15) minutes.

- ii. Hold eyelids apart to ensure all of the eye and eyelid tissues are well flushed.

1.6.5 Skin:

- i. Get the victim under a shower immediately even with his clothes on. Remove clothing while victim is showering.
- ii. Wash affected areas with large quantities of soap and water.
- iii. If burns are apparent, loosely cover affected areas and seek medical aid. Do not apply ointments or salves.

1.7 LIME

1.7.1 Employees shall wear goggles and suitable respirators to protect the eyes and respiratory tract.

1.7.2 Employees should shower after working with lime.

2.0 CHEMICAL HANDLING

2.1 Paints and Solvents

2.1.1 Adequate ventilation must be maintained at all times when paints or solvents are used.

2.1.2 Personnel should wear proper respiratory protection and protective clothing when the toxicity of the material requires such protection.

2.1.3 Flammable solvents and materials must be used with extreme caution when possible sources of ignition exists. There shall be no spray painting within six metres of a spark producing device.

2.1.4 Flammable paints and solvents must be stored in approved cabinets. There should be a maximum of one day's supply inside the building where the work is being done. Acids must not be stored with flammables.

2.1.5 All waste must be disposed of daily.

- 2.1.6 Persons should avoid the excessive use of solvents to remove paint from the skin. Do not use carbon tetrachloride. Protective creams help reduce skin contact with paints.
- 2.1.7 Personal protective equipment should be used to reduce the hazards of inhaling dust or fumes and the contact of paints with the skin. Persons should also take extra precautions with an open wound or sore even if it is bandaged.
- 2.1.8 Spray painting shall be done only in an approved area or booth.
- 2.1.9 The supervisor should check with the Electrical Section before any painting works are undertaken around or on electrical equipment.
- 2.1.10 A lifeline or belt must be used in elevated places when other types of protective equipment are not in use.

2.2 PVC Solvent Cement

- 2.2.1 Solvent cement contains highly volatile solvents, which evaporate rapidly. The following should be observed:
 - (a) Avoid breathing vapors.
 - (b) If necessary, persons should use a fan to blow fumes away from work area.
 - (c) Avoid skin or eye contact.
 - (d) Do not use near heat, sparks or open flame.
 - (e) Do not pressure test joints with compressed air or gas. This can result in severe injury.

3.0 CLEANING AND WAXING IN BUILDINGS

3.1 General

- 3.1.1 Warnings should be conspicuously placed to indicate to passersby that the floor is wet or being cleaned or newly polished.

- 3.1.2 Approved rubber gloves shall be worn when using strong washing solutions, cleaning water closets or urinals and in the disinfection of toilets.
- 3.1.3 Mops, brushes, buckets or other utensils must not be left in doorways.
- 3.1.4 Before dusting the top of tall cabinets or lockers remove loose objects.
- 3.1.5 When working at a doorway, secure the door either in the open or closed position.

4.0 COMPRESSED GAS SYSTEMS

4.1 Compressed air

- 4.1.1 Compressed Air shall not be used to clean clothing or any part of the anatomy nor should it be turned against a fellow employee.

4.2 Compressed gas cylinders

- 4.2.1 The hazards that may be associated with compressed gas cylinders are:
 - 4.2.2
 - (a) high pressure
 - (b) toxicity, reactivity/instability
 - (c) structure attack
 - (d) flammability
 - (e) extremely low temperature; and
 - (f) asphyxiation.
 - 4.2.3 Cylinders must be permanently marked or stenciled to identify the type of gas in the cylinder.
 - 4.2.4 Under no circumstances must a cylinder be accepted without proper identification of its contents, age and date of its most recent testing.
 - 4.2.5 Low pressure cylinders (<900 psi) shall be rejected on the following grounds:
 - a) dents, bulges or gouges pitting or corrosion
 - b) leaks
 - c) cracks in the neck

- d) tilted valve
 - e) distorted foot ring
 - f) any other recognized defects
- 4.2.6 Valve protection caps shall be in place when compressed gas cylinders are received, transported, moved or stored.
- 4.2.7 Extreme care must be taken with fittings and connections. Even if a fitting can serve for several gases, it is preferable to dedicate equipment to a single service use.
- 4.2.8 Beware of cross threading; use washers as recommended by the manufacturer.
- 4.2.9 Before making any connections, clear away any oil, grease and dirt. In the case of an oxygen cylinder, do not interfere but return promptly to supplier. Traces of organic matter in oxygen valve can cause explosions when the cylinder is opened.
- 4.2.10 Never tighten a leaking connection under pressure. Shut off the cylinder and vent the gas to reduce pressure before attempting to effect connection or repair.
- 4.2.11 The construction of the downstream piping must be compatible with the gas. Aluminum and stainless steel are recommended for the halogens (chlorine, etc.).
- 4.2.12 Pressure relief devices for steel cylinder are rated at 540C maximum. Do not store them near heat nor expose them to direct sunlight. Aluminum cylinders can be damaged at temperatures above 1770C.
- 4.2.13 Cylinder valves shall not be tampered with.
- 4.2.14 Cylinder valves must be closed when work is finished or cylinders are empty or being moved.
- 4.2.15 In moving, cylinders must be strapped to and transported in a cylinder cart.
- 4.2.16 Cylinders shall be properly secured (strapped or chained in an upright position at all times except when being hoisted or if designed for an alternative position).

- 4.2.17 Gas regulators shall be in proper working order when in use and only regulators specifically designed for the gas shall be used.
- 4.2.18 In the event of a leak from a cylinder, immediately remove it to a safe location outside the working area. Matches, candles or other open flames must never be used to trace gas leaks. Use the designated emergency kit or call the supplier immediately. Notify your supervisor and the Safety Officer.
- 4.2.19 Cylinders shall not be used as rollers.
- 4.2.20 Some pressure should always be left in a depleted cylinder to prevent air suck back, moisture and contamination.
- 4.2.21 Empty cylinders should be capped and labeled as such.

5.0 CONFINED SPACES

All confined spaces are considered dangerous because of inadequate ventilation and/or the introduction of hazardous gases and vapours, which may present unnoticeable conditions that could cause injury or asphyxiation. The minimum oxygen allowable by the Authority for work in confined spaces is 19.5% and this should be determined by testing and purging.

Confined spaces include but are not limited to - storage tanks, reservoirs, sewers, tunnels, manholes, pits or any area of limited access.

- a. No person shall enter a confined space without authorization or permit.
- b. Confined space must be clean, free of hazardous materials/chemicals and where necessary, purged by water or air before entry.
- c. Testing the ambient air - appropriate tests of the ambient air in confined spaces must be done to ensure that 10% of the lower explosive limit (LEL) is not exceeded; the threshold limit values (TLV) of toxic chemicals are not exceeded and the oxygen content is greater than 19.5%.

- d. Isolation - all input lines discharging into the confined space shall be disconnected, capped or isolated before entry.
- e. Electrical Lockout - when electrical devices located within the confined space are to be repaired or worked on, the line disconnect switches supplying power must be tagged and locked in the OFF position. The key is to be kept by the person performing the job; only that person is authorized to unlock the switch and remove the tag upon completion of the job. When more than one person is working on the line, each must place a lock on the switch and retain his own key.
- f. Switches supplying power to any mechanical device or apparatus in a confined space must be tagged and locked in the OFF position. This must be done for any entry even though work may not be performed on the apparatus itself.
- g. Securing Covers - all manhole covers shall be removed and openings kept clear of any obstructions. Hinged doors or lids shall be secured so that they cannot be closed.
- h. Removing Manhole Covers - never use fingers or hands to remove covers. Always use a tool such as a pick with the point bent in the form of a hook or a tool specially designed for this purpose.
- i. Continuous Monitoring - if the nature of the work to be performed introduces or has the potential to introduce harmful contents, continuous monitoring of the atmosphere is required. If there is any evidence of a buildup of dangerous air contaminants and or oxygen level below 19.5%, all personnel shall be evacuated.
- j. Ventilation - confined spaces must be ventilated by use of a positive mechanical system or arranged to avoid recirculating contaminated air. (Purge blower hose for at least one minute above ground before placing in confined space).
- k. At least one (1) standby employee shall be stationed just outside the access opening of any occupied confined space. Under no circumstance shall the standby employee enter the confined space. The person shall:
 - (a) Maintain continuous awareness of the activities and well being of the occupant of the confined space.
 - (b) Be able to maintain verbal communications at all times.

- (c) Be alert and fully capable of quickly summoning help.
 - (d) Be physically able and equipped to assist in the rescue of an occupant under emergency situation.
- l. Employees must be instructed prior to entering any confined space on protective equipment, lifelines and rescue plan.
 - m. Under no circumstances shall there be smoking in or around confined spaces particularly manholes, sewage wet wells or hydrocarbon containers.
 - n. The supervisors shall establish work period limits for the particular confined space.
 - o. There shall be immediate evacuation if the worker or a monitoring instrument detects toxic gases.

6.0 CONSTRUCTION

6.1 Construction Area

- 6.1.1 Construction areas must be clearly identified through the use of barricades, ropes, stanchions, fences, cones and appropriate signs.

6.2 Excavation and Trenches

- 6.2.1 Prior to any excavation work, the existence of underground pipes, electrical conductors, etc. must be determined from the respective utilities or agencies.
- 6.2.2 Trenches shall be sufficiently sloped in accordance with approved standards to prevent cave-ins or slides. In the absence of sloping, shoring must be used if the excavation is more than 1.5 meters in depth.
- 6.2.3 The front line supervisor shall make daily inspections of the excavation. If there is evidence of a cave-in, all work shall cease until the appropriate safeguards are taken.

- 6.2.4 Trenches more than 1.2 meters deep shall have ladders within 7.5 meters of lateral travel between means of egress.
- 6.2.5 Excavation and trenches must be adequately barricaded and identified.
- 6.2.6 Warning lights must be placed by excavation and trenches to provide sufficient warning of danger.
- 6.2.7 Excavated material, tools or equipment shall be placed at a minimum of 0.6 meters from the edge of the trench where practical.
- 6.2.8 Always face the excavating machine and stand back.
- 6.2.9 Appropriate Personnel Protection Equipment (PPE) shall be worn when using high impact tools such as jackhammers.

6.3 Road works

- 6.3.1 Employees who are required to make openings in the street shall guard all such openings and adopt the standard traffic control in conformity with the National Transportation Regulations and Standard of Road Works of the Standard Bureau.
- 6.3.2 Luminescent vests must be worn for night work.
- 6.3.3 Reinstatement must be consistent with sound engineering practice.

6.4 Mains (Commissioning)

- 6.4.1 During commissioning procedures, dangers may arise from:
 - (a) Inadequately supported blank ends, bends, etc. failing under test.
 - (b) Lateral or vertical movement of the pipe causing pipe or joint failure.
 - (c) Fittings failing test.
 - (d) Too rapid charging of the main.
 - (e) Malfunction and/or incorrect fitting of the test pump and gauges.
 - (f) Mishandling of chemicals during disinfection.

6.4.2 Precautions to be taken:

- (a) Ensure that caps or other temporary blanking fittings are adequately anchored with the load spread according to the strength of the supporting ground.
- (b) The trench should be partially refilled over at least 50 per cent of each pipe length to prevent lateral or vertical movement of the pipes.
- (c) Fill the main slowly, checking that the air valves are working correctly and that all air is exhausted from the main.
- (d) Shut off air valves before the test pressure is applied.
- (e) Ensure that all 'in line' valves are open or shut according to requirements.
- (f) When test is complete, slowly reduce the pressure and open the air valves.
- (g) Before swabbing the main, adequate arrangements should be made for retrieving the swab and discharging the flushing and heavily chlorinated water safely and without causing pollution.
- (h) Chlorine gas, sodium hypochlorite solution or other chemical disinfecting agents should be handled with care. Where chlorine gas is injected, the procedure should accord with instruction manual supplied by the manufacturer of the chlorinator. The operators throughout the disinfection procedure must wear eye protectors.
- (i) At all stages of commissioning, variations to the planned sequence of operations should be controlled to avoid danger to personnel working remotely from the supervisors. All personnel should be clearly advised of the loading on the temporary fittings and supports and the consequences if failure occurs.
- (j) At no time should air pressure testing be carried out on lengths of mains, although it may be permissible for testing joints or short lengths of pipe.

7.0 FALLS

The use of a safety belt is required on roofs and surfaces that slope more than fifteen (15) degrees, on slippery surfaces at lesser angles and in strong winds. A safety belt should always be used when working on elevated structures such as towers, stacks, platforms and tanks.

7.1 Floor Openings

- 7.1.1 Floor openings should be guarded by barriers and or railings or covered to withstand more than twice the load of a pedestrian or vehicle.
- 7.1.2 Where the danger of fallings exists for personnel, toe boards should also be provided along with guardrails.

8.0 FIRE PROTECTION

8.1 General

- 8.1.1 Employees with known heart disease, epilepsy or emphysema shall not participate in fire fighting emergencies unless certified by a physician.
- 8.1.2 No employee shall obstruct or render obscure any manually operated fire alarm or device.
- 8.1.3 Activating a fire alarm without cause will not be tolerated. Strict disciplinary measures will be taken.
- 8.1.4 Portable extinguishers should be visually inspected once per month and a maintenance check made annually by supervisors. Fire extinguishers shall be hydrostatically tested as advised by the Safety Officer.
- 8.1.5 Fire extinguisher shall be conspicuously located in hallways and near the doorway of workrooms. Illuminated signs and arrows shall be used to indicate the location of extinguishers.
- 8.1.6 Fire extinguishers shall be recharged after every use or whenever necessary as indicated by the gauge.

- 8.1.7 Fire alarms shall be tested or examined every three (3) months.
- 8.1.8 Fire drills shall be conducted annually and shall involve as a minimum, steps to familiarize employees with:
- (a) the means of escape and its use.
 - (b) the route to be followed in case of fire.
 - (c) the broad principles of fighting fires (for designated employees only)
- 8.1.9 All fires should be reported to the Safety Officer and recorded in a log book.

8.2 Fire Class - Extinguisher Relationship

- 8.2.1 Quick and appropriate response is crucial to fire fighting. In order to deal with a fire promptly the proper type of fire extinguisher must be used. Fires are classified into four (4) classes and the recommended extinguisher is as per table of Fire Class - Extinguisher Relationship.

<u>FIRE CLASS</u>	<u>EXTINGUISHER REQUIREMENTS</u>
<p><i>Class A</i></p> <p>Ordinary combustible, e.g. wood, cloth, paper rubber and plastics.</p>	Water
<p><i>Class B</i></p> <p>Flammable combustible, e.g. liquids, flammable gases and greases</p>	Carbon Dioxide - Dry Chemical
<p><i>Class C</i></p> <p>Live electrical equipment</p>	Multi-purpose dry chemical and carbon dioxide
<p><i>Class D</i></p> <p>Combustible metals</p>	Dry powder

e.g. titanium, sodium magnesium,
aluminum and potassium.

8.2.2 The following are obsolete extinguishers and must be returned to the Safety Officer:

- (a) all inverting type extinguishers
- (b) self-generating soda acid extinguishers
- (c) gas cartridge operated water extinguishers
- (d) self-generating foam extinguishers
- (e) vaporizing liquid extinguishers (carbon tetrachloride and chlorobromomethane).

8.2.3 All modern fire extinguishers operate on the same principle - they use pressure to propel the contents of the tank. They are simple to use:

- (a) PULL THE PIN: It is located on the top of the extinguisher and has a loop for pulling.
- (b) POINT THE NOZZLE: In most cases, using the nozzle with a sweeping motion back and forth at the base of the fire, is the most effective method of containment.
- (c) SQUEEZE THE HANDLES: (Releasing the handles stops the extinguisher) OR PUSH IN THE PROPELLANT TOP AND SQUEEZE THE HANDLES ON THE NOZZLE.

8.3 Flammable and Combustible Materials

8.3.1 There are operating hazards associated with the user of flammable/combustible liquids, for example:

- (a) Volatility - vapours combine with air and can ignite and burn. The hazard increases with temperature.
- (b) Vaporization when spilled or heated.

- (c) Invisibility and density of vapours - they are usually heavier than air and will therefore settle at the lowest levels. Ignition sources, such as welding can then cause fire.
 - (d) Skin irritation on contact.
 - (e) Inhalation hazard - varies with time of exposure, concentration and toxicity of the vapour.
- 8.3.2 Flammable Liquids must be dispensed in approved safety cans with flash screens, pressure relief devices and self-closing covers.
- 8.3.3 Flammable Liquids shall be kept in closed (covered) containers when not in actual use.
- 8.3.4 The transfer of a flammable/combustible liquid shall be done under the following conditions:
- (a) Adequate ventilation
 - (b) Adequate grounding and bonding to prevent or dissipate static charge;
 - (c) Elimination of all sources of ignition (e.g. no smoking, naked flames, etc.)
- 8.3.5 Containers shall be properly identified by labelling to prevent accidental mixing and to alert the user of danger.
- 8.3.6 Large quantities of flammable/combustible liquids should be stored in a separate building with two-hour fire resistant walls, blow out wall floor drainage and ventilation.
- 8.3.7 Smaller quantities (less than 20 litres) must be held in storage cabinets.
- 8.3.8 No building accessible to the public should store more than 50 litres of flammable or combustible liquid with a flash point below 600C.
- 8.3.9 Flammable/combustible liquids must not be transported in a confined space in a vehicle. Only a vehicle designed for this purpose must be used.
- 8.3.10 Under no circumstances must oxidizing material be stored with flammable or combustible liquids.

8.3.11 When using flammable/combustible liquids, the following precaution should be taken:

- (a) Use gloves made of material resistant to the solvent.
- (b) Eye protection should be used to avoid splashing in the eyes.
- (c) In the event of skin contact, flush with large amounts of water.

9.0 LABORATORY SAFETY

9.1 General

- 9.1.1 Tidiness and cleanliness of benches and apparatus are essential for safe working. Benches should not be crowded.
- 9.1.2 Work of a non-routine nature should not be undertaken by Scientific Assistants unless procedures have been approved by a Chemist.
- 9.1.3 Stepladders should be used to reach high level shelves, etc. Stools or boxes should not be used.
- 9.1.4 Working alone in a laboratory is dangerous and should be avoided. If there is a no alternative, arrangements should be made for a regular check under an emergency plan.
- 9.1.5 If water or chemicals are spilled on the floor or bench, they must be cleaned up immediately. A spill cart with neutralizing chemicals and fire extinguishers should be available for emergency use.
- 9.1.6 Food or drink should not be placed on laboratory benches or consumed in the laboratory.
- 9.1.7 Smoking is prohibited in the laboratory.
- 9.1.8 All bottles, including reagent and wash bottles must be accurately and clearly labeled bottles shall be disposed of with caution and under supervision.

- 9.1.9 Hands should be thoroughly washed with soap whenever contact is made with chemicals, sewage or any other material.
- 9.1.10 Appropriate personal protective equipment must be worn at all times including laboratory coats.
- 9.1.11 Cylinders of compressed gas shall not be used to a very low level, as this could be dangerous.
- 9.1.12 Special caution must be used when working with chemicals that are known as carcinogens or otherwise toxic. Suitable personal protective equipment measures shall be used to maintain exposure below the most recent threshold limit values (TLV) specified.
- 9.1.13 Chemicals shall be stored/secured so as to minimize the possibility of reacting with one another.

9.2 Bacteriological

- 9.2.1 All persons shall receive adequate training in basic principles of bacteriological cultures before being allowed to handle infected material or bacteriological cultures.
- 9.2.2 A high standard of personal hygiene must be maintained at all times. Fingernails should be kept short and hands washed thoroughly after handling infected material. Before leaving the laboratory, all hands should be thoroughly washed; all cuts and bruises must be suitably covered.
- 9.2.3 Smoking, eating and drinking is forbidden at all times in the lab.
- 9.2.4 Access to the laboratory should be restricted.
- 9.2.5 Always allow the autoclave to cool well below 100 C before opening. Never hasten the opening of an autoclave by venting of residual pressure; no one should stand directly over the autoclave when opening it. When autoclaving screw-capped glass vessels, the top must be loose to avoid explosions.

9.2.6 Oral pipetting shall not be permitted.

10.0 LANDSCAPING AND GARDENING

10.1 Hazards

10.1.1 The main hazards associated with landscaping, gardening and grass cutting machinery (the machine) are:

- (a) The risk of the operator losing his footing, which might result in injuries whilst using the machine.
- (b) The machine throwing up debris, which might injure the operator and bystanders.

10.2 Safety Rules to be observed:

- 10.2.1 The operator must be trained in handling any machinery he may be required to use.
- 10.2.2 The operator should check the area in which the machine is to be used and remove stones, large sticks, wire and debris before commencing mechanical operations.
- 10.2.3 All guards and fastening should be checked before started the machine. The operator should wear all appropriate protective clothing and equipment and loose fitting garments should be kept away from machinery.
- 10.2.4 Securing ropes, safety lines and buoyancy aids should be available and used where necessary.
- 10.2.5 Operators should be instructed to report all damage or faults as soon as possible.
- 10.2.6 Machinery should only be refueled when at rest with the engine switch off and cooled where appropriate.
- 10.2.7 The engines of all grass cutting and similar machinery should be switched off before attempting to clean or adjust the machines. Rotary mowers and direct drive machines should have the spark plug lead(s) removed or shorted to earth before the blades are turned by hand, to prevent the engine starting inadvertently.

- 10.2.8 No machinery should be left on and unattended.
- 10.2.9 Operators should read the manufacturer's safe operating instructions/manual before use. These instructions shall be readily available and prominently displayed.
- 10.2.10 Particular care should be taken by operators of chain saws to ensure that the chain is kept lubricated and that personnel nearby are not endangered.

11.0 LIFTING AND MATERIAL HANDLING

11.1 Fork Lift Trucks

- 11.1.1 The operator is the only person permitted to ride on a fork lift truck
- 11.1.2 No fork lift truck shall be loaded above its rated capacity.
- 11.1.3 Forks should be carried just high enough to clear the ground except when approaching loads.
- 11.1.4 Flashing light must be ON as a visual warning when the ignition is on.
- 11.1.5 The horn should be sounded at the blind corners.
- 11.1.6 Pedestrians have the right of way at all times.
- 11.1.7 The field of vision must not be obstructed at normal eye level.
- 11.1.8 All loads obstructing vision must be carried trailing.
- 11.1.9 No smoking is permitted within three metres of a Fork lift truck.
- 11.1.10 The mast of the fork lift truck shall not be raised or lowered while traveling.
- 11.1.11 Fork Lift trucks shall not be operated on damaged pallets or insecure or unsafe loads.
- 11.1.12 No one shall stand or walk under the elevated forks.

- 11.1.13 When driving loaded up an incline, the load must lead and in driving downhill the truck must be driven in reverse with the forks and load trailing.
- 11.1.14 When driving unloaded up an incline, the fork lift truck shall be driven in reverse; when traveling unloaded down an incline, the truck shall be driven with forks leading.
- 11.1.15 Ramps and bridges must be inspected for safe passage before driving on them.
- 11.1.16 Fork Lift trucks shall be driven on the left of the aisle.

11.2 Manual Lifting And Material Handling

- 11.2.1 Research has shown that the majority of problems associated with lifting manually are caused by:
 - (a) the weight of the object, particularly over 25kg (55 lbs)
 - (b) lack of assistance
 - (c) bulky objects, and
 - (d) the unavailability of material handling systems.

11.3 Manual Lifting recommendations

- (a) Lift comfortably.
- (b) Avoid bending the back. Bend the knees.
- (c) Avoid excessive weights and heights. Make sure there is clear access to the level to which the object is to be lifted.
- (d) Avoid twisting with the load.
- (e) Lift gradually.
- (f) Keep in good physical condition.
- (g) Warm up prior to heavy work.
- (h) Insert rest pauses in repetitive lifting.

11.4 Crew Lifting:

- 11.4.1 Whenever materials are removed manually by more than one person, only one designated person shall give instructions and signals.
- 11.4.2 When pipes or other long objects are being transported, they should be held on the same side by all members of the crew.

11.5 Crane Lifting:

- 11.5.1 Whenever materials are being lifted by cranes, only one designated person shall give instructions and signals.
- 11.5.2 Loads should always be secured before lifting.
- 11.5.3 All cranes shall be inspected by a competent employee for defects.
- 11.5.4 Ropes/cables on cranes shall be inspected once per month by a competent employee and or before use by the user for corrosion kinks and worn wires.
- 11.5.5 No one shall be allowed under a suspended load.
- 11.5.6 No crane shall be loaded in excess of its rated load.
- 11.5.7 Qualified crewmen shall govern Crane operation only.

11.6 Material Handling:

- 11.6.1 Multipiece rim tyres should be fully inflated in a restraining device.
- 11.6.2 Jacks should be thoroughly inspected every six (6) months by the user.
- 11.6.3 Every precaution should be taken to prevent uncontrolled rolling of pipes.
- 11.6.4 When aligning pipe in a trench, keep hands and fingers away from the ends of the pipe or other appurtenances to prevent crushing. Use appropriate gloves.
- 11.6.5 Care should be taken in the handling of objects with sharp edges by hand.

12.0 LOCKOUT / TAGOUT

12.1 General

12.1.1 An employee involved in servicing or otherwise maintaining plant and machinery or rotating equipment must be certain that it is impossible to energize, start up or otherwise activate such equipment while carrying out these duties. Employees can be exposed to grave risk, should it be possible to set the equipment in motion while maintenance work is in progress.

12.2 Lockout Device

12.2.1 A lock out device is a mechanism or arrangement that allows the use of one or more key padlocks to hold an isolation device in the “off” position.

12.3 Danger Tags

12.3.1 Danger tags are cards on which letters or markings appear. These letters or markings or both are warning for safety instructions of employees who may be exposed to hazards. They are to be affixed to the devices in question.

12.4 Use of Lockout

12.4.1 The following are some jobs for which lockouts must be used:

- (a) Making repairs on electrical circuits.
- (b) Cleaning or oiling the movable parts of machinery, particularly where dangerous nip points are involved.
- (c) Clearing blocked or jammed mechanisms.
- (d) Working on lines carrying hazardous substances or high pressure (safeguarded by locking out valves, capping or blanking off lines)

12.5 Lockout Procedure

12.5.1 Locks and lockout clamps must be used on every appropriate occasion. The following is a general procedure:

- i. Before any equipment is locked out, there should be an agreement as to the specific unit to be taken out of operation and the panel in which it should be locked out.

- ii. Engineering and/or production supervisors/managers must oversee lock out procedures.
- iii. Turn the main power control (switches, breakers, valves etc) off.
- iv. After the switch has been opened or the valve closed, the Supervisor/Manager will snap the lock(s) on the control lever or lock out clamp. At this point the appropriate "Danger Tag" should be attached.
- v. Confirm that the valve or switch cannot be moved to "On" and the locked out equipment is in fact locked out.
- vi. Test the machine controls themselves to ensure that the main controls are "Off".
- vii. Under no circumstances should production remove an engineering lock or engineering remove a production lock.
- viii. The employee or the employee's supervisor locking/tagging out the machinery or equipment is the only person authorized to remove the lock or tag,
- ix. If this is done then the employee must be informed of the removal of the lock or tag before he resumes work.

13.0 MEDICAL

13.1 First Aid

- 13.1.1 First aid is the immediate and temporary care of the ill or injured by persons, at the scene of the incident, while awaiting a physician.
- 13.1.2 In the event of injury or illness, first aid must be sought at once. If necessary, the victim should then be taken to the nearest Health Centre or Hospital.
- 13.1.3 All accidents, injuries or illnesses must be reported to the supervisor. The Safety Officer must be notified in accordance with the accident reporting procedure.
- 13.1.4 First aid is the immediate and temporary care of the ill or injured by persons, at the scene of the incident, while awaiting a physician.

- 13.1.5 In the event of injury or illness, first aid must be sought at once. If necessary, the victim should then be taken to the nearest Health Centre or Hospital.
- 13.1.6 All accidents, injuries or illnesses must be reported to the supervisor. The Safety Officer must be notified in accordance with the accident reporting procedure as per Section 25 of this policy.

13.2 Life Threatening Illness

- 13.2.1 When dealing with situations involving life threatening or contagious illnesses, supervisors should:
 - 13.2.2 Be mindful of the confidential nature of information regarding the employee's health condition.
 - 13.2.3 Contact the Personnel Department if there is concern about the possible contagious nature of an illness.
 - 13.2.4 If warranted, make reasonable accommodation for employees with life threatening or contagious illness, consistent with the needs of the Authority.
 - 13.2.5 Favorably consider transfer, if requested, by employees with diseases where there is undue emotional stress, such transfers must be consistent with the Authority's needs.
 - 13.2.6 Be sensitive and responsive to co-workers' concerns and emphasize employee education.
 - 13.2.7 Encourage employees to seek assistance through support groups, medical treatment and counseling.

13.3 Return to work After Sick Leave

- 13.3.1 Anyone who tendered a medical certificate for a sick leave, upon return to work, may be required, if the Authority considers it necessary, to submit a "statement of physical capacity to return to work" duly completed by the employee's physician.

- 13.3.2 The Authority encourages the earliest possible return to work after an injury or illness.
- 13.3.3 Contact the Personnel Department to determine if a statement should be obtained from the employee's attending physician that continued presence at work will pose no threat to the employee, co-workers or customers. The Authority reserves the right to require an examination by its medical doctor or panel of doctors.

14.0 METER READING

Meter readers should list any hazards on their field reports and submit such lists to the Safety Officer and their supervisors.

15.0 MOTOR VEHICLES

15.1 General

- 15.1.1 Drivers of vehicles, both private and those belonging to the Authority, must be parked in designated areas. Parking in reserved areas or roadways is prohibited. Persons whose vehicles are improperly parked will face either disciplinary action or their vehicles being towed away.
- 15.1.2 Vehicles must yield to pedestrians crossing in marked lanes.
- 15.1.3 All drivers must comply with posted speed limits or other traffic regulations on the property of the Authority.
- 15.1.4 Unauthorised use of the Priority Bus Route is not permitted

15.2 WASA Vehicles

- 15.2.1 All employees, when they are operating the Authority's vehicles, should bear in mind that they are representatives of the Authority and should pay specific attention to the following:

- 15.2.2 Drivers of vehicles shall know and observe all traffic and motor vehicle regulations, including but not limited to non-use of hand held cell phones whilst driving, and unauthorized use of the priority bus route.
- 15.2.3 No person shall operate a WASA vehicle unless he/she is physically qualified to do so, and the driver's abilities or alertness are not impaired through fatigue, illness, intoxication or recreational drugs.
- 15.2.4 No driver shall use WASA vehicles to transport goods other than those consigned to the Authority.
- 15.2.5 Drivers must not deviate from their prearranged route.
- 15.2.6 No driver, while on duty, shall possess, consume or be under the influence of an alcoholic beverage.
- 15.2.7 No motor vehicle of the Authority shall be driven unless it is in good working order.
- 15.2.8 While riding in WASA's vehicles, sit within/on the seats as provided. No person shall sit on the bonnet, running boards, hood, fenders or between body and cab, etc. When mounting or dismounting, use only the steps and ladders provided for this purpose.
- 15.2.9 Every driver should be instructed by the Transport Officer, in the use of the accident report form
- 15.2.10 In the event of an accident, the driver of the Authority 's vehicle should :
- (a) stop immediately
 - (b) protect the accident scene and take photos if possible
 - (c) render first aid, if qualified, to any injured person and/or assist wherever possible in getting the injured to hospital.
 - (d) not leave the scene without first establishing his identity and contact to the other party and obtaining the names and addresses of persons, witnesses and the license numbers of vehicles involved.
 - (e) note location and time of accident.

- (f) not accept liability with any person other than authorized WASA personnel.
- (g) report the accident to the Police, Transport Manager and the Safety Officer.
- (h) not move his vehicle from the scene of an accident until he has been told to do so by an authorized WASA representative or by order of the Police. Where circumstances warrant it, he may proceed to move the vehicle only after its position has been clearly identified by markings.

15.2.11 No driver or any employee shall:

- (a) refuel a vehicle with the engine running.
- (b) smoke or expose any open flame in the vicinity of the vehicle being refueled.
- (c) fuel a motor vehicle unless the nozzle is in continuous contact with the inlet pipe of the fuel tank.

15.2.12 The driver, upon returning a vehicle for the day, will report on the condition of the specified parts and accessories

15.2.13 Persons who do not comply with this policy are liable to disciplinary action.

15.3 Jumper Cables

15.3.1 In using jumper cables, the following shall be observed:

- (a) safety glasses must be used
- (b) ensure that vent caps are tight and level and a damp cloth placed over them.
- (c) ensure that the vehicles are not touching.
- (d) both electrical systems must be of the same voltage.

15.3.2 Jumper cables shall be attached as follows:

- (a) clamp one jumper cable to positive (+) terminal of discharged battery.

- (b) connect the end of the same cable (other positive end of cable) to positive terminal of booster battery.
- (c) connect one end of the second jumper cable to the negative terminal of the booster battery.
- (d) make final connection of the other end of the second cable to the engine block of the stalled vehicle away from the negative pole of the dead battery, carburetor, tubing or moving parts.
- (e) stand back from both vehicles, start car with good battery, then start the disabled vehicle.
- (f) remove cables in reverse order beginning with the metal ground.

16.0 OFFICE SAFETY

16.1 General

- 16.1.1 Working conditions as far as possible should be comfortable to the employee.
- 16.1.2 When in doubt as to the ergonomic suitability in the purchase of office equipment or furniture and the modifications of any mode of operation, the Safety Officer shall be consulted.

17.0 SEWERAGE WORKS

17.1 Personal Hygiene

Wastewater and its by-products are potential hazards to treatment plant personnel. The hazards include typhoid fever, para-typhoid, dysentery, infectious hepatitis, jaundice and tetanus. The best defense against infection is the practice of good personal hygiene. The following practices should be strictly observed:

- 17.1.1 Hands and fingers should be kept away from the nose, mouth, eyes, and ears.
- 17.1.2 Wash hands frequently and thoroughly with soap.

- 17.1.3 Fingernails should be kept short and all foreign material removed from the fingernails. Use protective clothing and gloves when it is necessary to come in contact with sewage as in cleaning pumps, handling screenings, wastewater, sludge, etc.
- 17.1.4 Work clothes should not be worn home and fresh clothes must not be stored with used clothes; work clothes should be laundered separately.
- 17.1.5 Drink only from provided water fountains.
- 17.1.6 Avoid areas where there are sewage sprays.
- 17.1.7 "No Smoking" signs in designated areas shall be strictly observed.
- 17.1.8 Gloves must be worn when any part of the skin is broken.
- 17.1.9 All cuts or scratches must be promptly given first aid treatment.

17.2 Plant Layout

- 17.2.1 Treatment plants and all stations shall be securely fenced to guard against vandalism and to protect the public. These fences shall be a minimum of 1.8m in height.
- 17.2.2 All access gates must be secured with locks.
- 17.2.3 Signs shall be posted along the fencing designating the nature of the facility and advising against trespassing.
- 17.2.4 There shall be appropriate exterior layout to channel visitors to parking and office facilities.
- 17.2.5 There shall be adequate lighting on walkways and stairways.
- 17.2.6 Exterior flood lighting must be provided for night operators.
- 17.2.7 All emergency diesel generators must be in good mechanical order.
- 17.2.8 All pipings must be color coded.
- 17.2.9 Warnings signs shall be posted in hazardous areas.

17.2.10 Portable oxygen supply should be available.

17.2.11 Lunchroom or eating facilities must be maintained in sanitary conditions.

17.3 Safety Equipment

17.3.1 The following are the types of equipment that should be available for use in sewerage works and should be used where necessary:

- (a) portable fresh air blowers and large diameter hoses for ventilation.
- (b) atmospheric testing equipment to identify oxygen deficiencies, explosive toxic or combustible gases.
- (c) self contained breathing apparatus.
- (d) resuscitator
- (e) first aid kit
- (f) barricades, traffic cones, warning signs and flashers
- (g) fire fighting equipment
- (h) lifelines and life saving buoys.
- (i) general protective clothing, such as gloves, rubber boots, safety shoes and rain gear.

18.0 STAIRWAYS

18.1 General

18.1.1 Do not run on stairs. Take enough time to be safe and where provided use the handrails.

18.1.2 Stairs must be kept free from grease and other wet or slippery substances or conditions capable of causing a fall.

18.1.3 Handrails shall be frequently inspected by a designated officer to make sure that they are free of splinters or loosened nails and that they have not become loose from their moorings.

- 18.1.4 Tool supplies or other materials shall not be stored on stairways.
- 18.1.5 Employees should desist from congregating in the aisles and passageways of stairways.
- 18.1.6 In using stairs, employees should:
- (a) always watch the steps just ahead and ensure that any load that is being carried does not obstruct your vision.
 - (b) take only one step at a time.
 - (c) look carefully in the direction of movement. If attention is distracted, stop until vision can be directed back to the passage.
 - (d) report all loose treads, risers and handrails for immediate repairs.

19.0 TOOLS

19.1 Abrasive Wheels

Many accidents occur in workshop and field operations due to breakage of abrasive wheels, incorrect mounting, incorrect use and contact with the wheel.

- 19.1.1 No wheel shall be operated above its maximum permissible speed.
- 19.1.2 No person shall mount an abrasive wheel unless he is trained to do so.
- 19.1.3 A wheel shall only be mounted on the machine for which it was intended.
- 19.1.4 All wheels should be checked for damage prior to mounting.
- 19.1.5 All operators must be trained in the safe operation of the machine.
- 19.1.6 Working areas immediately surrounding the machine in operation must be maintained in good condition and be free from obstructions.
- 19.1.7 The correct type of wheel for the task to be carried out must be selected. It must always be properly secured in position prior to use.
- 19.1.8 Regular adjustment is necessary and must be made to compensate for wheel wear to keep the rest as close as possible for the wheel.

- 19.1.9 Flammable and combustible gases or materials must not be stored or placed in the close proximity to where abrasive wheels are being used.
- 19.1.10 Loose clothing can easily be drawn in between the wheel and work place. Rags and waste must not be used near a revolving wheel.
- 19.1.11 Eye protection must be worn during grinding operations. Transparent screens should be fitted to fixed machines to intercept sparks and particles.

19.2 Hand Tools

- 19.2.1 The appropriate tool for the job shall be selected at all times - never use a makeshift.
- 19.2.2 Hand tools should be cleaned and inspected daily and stored in a proper place. Defective tools shall be repaired or replaced.
- 19.2.3 Hand tools should never be thrown.
- 19.2.4 Avoid using tools on moving machinery; stop the machine before making adjustments.
- 19.2.5 Check the clearance at the workplace to make sure that there is space in the event of the tool slipping.
- 19.2.6 Hands shall be protected by wearing gloves when working in confined places.
- 19.2.7 Rings shall not be worn when using hand tools.
- 19.2.8 Sharp or pointed tools must be carried covered and pointed away from the body.
- 19.2.9 Eye protection shall be worn when using impact tools on hard brittle material.
- 19.2.10 Tools should not be placed on the top of stepladders or on places from which they may fall on someone below.
- 19.2.11 Non spark tools shall be used whenever a fire hazard exists.

19.3 Portable Power Tools

Shock is the chief hazard presented by electrical power tools. The power lines should always be disconnected before accessories are changed.

- 19.3.1 Only tools listed by the Underwriters Laboratories (UL) or other standard organizations should be used.
- 19.3.2 Tools shall be kept in good repair.
- 19.3.3 Tools should be grounded when in use.
- 19.3.4 Employees should examine both the cord and connection carefully before use, ensure that the extension cord is appropriate for the tool.
- 19.3.5 Electrical cords should be protected against contact with oils, hot surfaces, chemicals, kinking or being damaged by traffic.
- 19.3.6 Before operating power tools and similar equipment, the operator must ensure that the correct guard is fitted on the tool or equipment and that it is properly adjusted.
- 19.3.7 Power tools must not be used for any other purpose than those for which they are designed.
- 19.3.8 When working with power saws and similar equipment on small pieces of woodstock, use a "push-stick".
- 19.3.9 Do not reach over or around a moving power saw.
- 19.3.10 Employees should inspect all power saws for kinks, fractures or breaks before using them.

20.0 USE OF LADDERS

20.1 General

- 20.1.1 The use of faulty, defective or broken ladders is prohibited. Ladders must be inspected before use.
- 20.1.2 Portable rung and cleat ladders, where possible, should be used with a pitch such that the horizontal distance from the top support to the foot of the ladder is one quarter the working length of the ladder.
- 20.1.3 Ladders shall not be used on barrels, boxes or other unstable bases to gain height.
- 20.1.4 18.4 The user shall face the ladder when ascending and descending.
- 20.1.5 No ladder should be used to access a roof unless the ladder extends above the eaves or guttering by one metre.
- 20.1.6 Employees must not work from the top two rungs or steps of straight or extension ladders nor from the second rung from the top of a stepladder.
- 20.1.7 Portable metal ladders must not be used for electrical work or where they may be in contact with electrical conductors.
- 20.1.8 When using a ladder in an aisle or any area not designated as a “construction area”, the area around the ladder must be identified with barricades, ropes, stanchions, cones, or there must be another employee to direct pedestrian or vehicular traffic around the work area.
- 20.1.9 Ladders shall not be painted except for identification marks.
- 20.1.10 Straight and extension ladders shall be chained or roped at the top or held by someone.
- 20.1.11 Supervisors whose work involves the use of ladders should have full charge of the ladder and be responsible for its maintenance.

21.0 WATER BODIES AND ASSOCIATED WORKS

21.1 Reservoirs, Lakes and Dams

- 21.1.1 It shall be the duty of all employees to watch carefully for any unusual conditions in a dam structure and immediately report them to the Plant Superintendent or Engineer.
- 21.1.2 Warning signs and guard rails must be placed where the public is likely to approach any hazardous area.
- 21.1.3 A life jacket shall be provided for each person who has to operate from a boat on a reservoir/lake. All such personnel must have prior instructions on the use of the life jacket.
- 21.1.4 Boats operating on reservoirs/lakes shall have anchors and two oars. There should be a standby boat on every lake.
- 21.1.5 Dams shall be inspected for structural integrity by competent engineers every five (5) years.

21.2 Work On or Near Water

Working on or near water creates hazards additional to those normally experienced at other places of work; therefore, extra precautions must be taken.

- 21.2.1 Adequate training and supervision must be given to all personnel involved who must also be advised of dangerous or potentially dangerous areas from factors, such as tides, currents, winds, banks and weirs.
- 21.2.2 A lifebuoy and lifeline of an approved type and a rescue hook must be available and ready for use.
- 21.2.3 Where the water is flowing sufficiently fast to carry the person away and the water way is narrow and unused, an additional safeguard of a hanging catenary chain or rope approximately five centimetres above the water level is strongly recommended.
- 21.2.4 An approved safety harness or belt and lifeline must be worn at all times when working near or adjacent to a well.

21.3 Working over Water

- 21.3.1 When working over water, a person must wear an approved type of safety harness or belt and that harness or belt must be anchored to the support on which the person is working in such a way that if he falls the harness or belt, anchor line and support will safely bear his weight.
- 21.3.2 Where work is being carried out within, over or around large bodies of water, a standby boat should be available at all times. Members of the work force should be trained in rescue of unconscious and injured persons from water. It is also desirable that members of the work force be trained in the use of resuscitation equipment and the technique of resuscitation.
- 21.3.3 Where groups and individuals are working in remote situations, consideration should be given to establishing adequate communications procedures.

22.0 WORKSHOPS

22.1 Carpenter Shop

- 22.1.1 Edged tools should be stored in places and positions where other employees cannot be injured by them.
- 22.1.2 Nails should be bent down or removed from loose pieces of lumber.
- 22.1.3 Always shut off power before adjusting or removing the blade on any band saw. When opening band saws, be sure that there are no kinks in the blade.
- 22.1.4 When raising or lowering equipment or materials pay attention to persons who may be working above or below.

22.2 Garage

- 22.2.1 Metal props or other approved safety blocks must be installed before working under any vehicle that has been jacked up.

- 22.2.2 Flammable liquids, such as gasoline, kerosene and cleaning solvent must be kept in approved containers.
- 22.2.3 Smoking is not allowed within the immediate vicinity of any flammable material.
- 22.2.4 All waste, tools, clothes, etc should be removed from a finished vehicle before releasing it for use.
- 22.2.5 Protect the engine compartment from fire hazards when using oxygen/acetylene torches for body or fender work.
- 22.2.6 Do not release any vehicle in which the following are in not safe operating condition:
- (a) foot brake or hand brake
 - (b) steering mechanism
 - (c) lighting system
 - (d) windscreen wiper
 - (e) horn
- 22.2.7 Spilled oils and grease must be cleaned up at the end of each repair job. Such spillage into an aisle or passage way must be cleaned up immediately.

22.3 Use of cleaning solvent:

- 22.3.1 Use the proper cleaning solvent for clothing, tools and machinery.
- 22.3.2 Ensure that your skin is cleaned of oil and grease, particularly before a lunch period and at the end of the workday. Wash with soap and water. Gasoline, turpentine and other cleaning solvents should not be used as a skin cleaner.
- 22.3.3 Vehicles are not to be driven onto the service ramps unless and until a guide has been designated to give proper signals.

22.4 Welding, Cutting and Brazing

- 22.4.1 Welding or cutting shall be done only in areas that are safe or have been made safe or at specific areas designated for such work.

- 22.4.2 Welding or cutting permits or authorization shall be obtained from the Safety Officer or Engineer in charge whenever work is to be done out of a designated area.
- 22.4.3 Welding helmets or hand shields shall be used during all arc welding or cutting operations.
- 22.4.4 Welders must ensure that the correct shade of filter lenses is selected for the type of job and should wear spectacle goggles under their welding helmets.
- 22.4.5 Non-combustible or flame proof shields or screens must be used to protect employees from sparks and direct rays or arcs.
- 22.4.6 Cylinders shall be kept at a safe distance or shielded from welding or cutting operations. They shall not be placed where they can come into contact with an electrical source.
- 22.4.7 Torches assemblies must be equipped with reverse flow check.
- 22.4.8 Under no circumstances must oxygen cylinder regulators be lubricated with grease or oil.
- 22.4.9 A fire watch must be arranged with suitable fire extinguisher or extinguishing system at or near the welding or cutting operation whenever combustible or hazardous materials are present. The fire watch shall continue for half an hour after the work to detect and extinguish any smoldering fires.
- 22.4.10 Welding, cutting or other hot work shall not be done on chlorine lines or containers until they have been thoroughly purged.
- 22.4.11 Hydrocarbons, metallic dust, acetylene, ammonia, hydrogen and organic matter should be stored in such a way to prevent admixtures.
- 22.4.12 Do not allow clothing to become saturated with oxygen since it can burst into flames with the slightest spark. This can envelope the wearer in a flash causing third degree burns over most of the body and the upper respiratory tract.

APPENDIX F – DEFINITION OF TERMS

Item No.	Word/Phrase	Definition
1	Accident	An unexpected, unplanned event or a sequence of events that occurs through a combination of causes that result in injury or damage to property and/or equipment
2	Ceiling Values	The airborne concentration of toxic material which should not be exceeded even momentarily
3	Combustible Liquid	Liquid with a flashpoint at or above 37.8°C (100 °F)
4	Construction Area	Any area used to perform construction, alteration and/or repair, painting or decorating regardless of the nature of work or length of time
5	CPR	Cardio Pulmonary Resuscitation- A first aid procedure and emergency care for sudden death, cardiac arrest or respiratory arrest. It involves a combination of mouth to mouth breathing or other ventilation techniques and chest compression
6	Dangerous Occurrence	<p>The following shall constitute a dangerous occurrence:</p> <p>(a) The collapse or overturning of any lift, hoist, crane, excavator or any load bearing equipment which is liable to cause a major injury.</p> <p>(b) The explosion, collapse or bursting of any closed vessel, reservoir, dam etc.</p> <p>(c) Any electrical fire or explosion.</p> <p>(d) An explosion or fire at any office or plant that resulted in stoppage of work.</p> <p>(e) The uncontrolled release of any toxic gas or flammable liquid.</p> <p>(f) Any collapse of scaffolding more than 12m high</p> <p>(g) The collapse of any building or structure.</p> <p>(h) Any incident leading to a toxic effect on any person through inhalation, injection, absorption or oxygen deficiency.</p> <p>(i) Any case of acute ill health when there is reason to believe that this resulted from occupational exposure to pathogens or toxic substances.</p>

Item No.	Word/Phrase	Definition
7	DBA	The decibel (dB) sound level on the A scale. It is a dimensionless unit used to express the logarithmic ratio of as measured quantity to a reference quantity.
8	Ergonomics	The application of human biological science in conjunction with engineering sciences to achieve optimum adjustment of man and his work, the benefits being measured in terms of human efficiency and well being
9	First Aid	<p>The following shall be considered first aid:</p> <ul style="list-style-type: none"> (a) Application of antiseptics and elastic bandages when and where necessary in response to an injury. (b) Treatment of first degree burns. (c) Removal of foreign bodies not embedded in the eye. (d) Uncomplicated removal of foreign bodies from wounds. (e) Use of non-prescription drugs. (f) Application of hot or cold compresses for the first time or visit. (g) Application of ointments to abrasions. (h) Use of whirlpool - bath as therapy. (i) Negative X-ray diagnosis. (j) Observation of injury.
10	Flammable Liquids	Any liquid having a flash point below 37.8°C (100°F).
11	Flash Point	The minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentrations to form an ignitable mixture with air near the surface of the liquid.
12	Floor Openings	An opening measuring 4.7cm (12 inches) or more in its least direction in any platform, pavement or yard through which a persons may fall, e.g. stairs or ladder openings, hatchways or manholes

Item No.	Word/Phrase	Definition
13	Ground Fault	Any path circuit established unintentionally between a current carry conductor and ground
14	Hazard	A hazard is the possibility that exposure to a material will cause injury under specific conditions
15	Illness	Any abnormal condition or disorder, other than one resulting from an occupational injury, caused by exposure to environmental factors associated with employment. It includes acute or chronic conditions which may be caused by inhalation, absorption, ingestion or direct contact. It may also be chemical, physical, biological or psychological in nature.
16	Incident	An event that may cause or causes an interruption or a crisis i.e. injury or illness, damage to assets, the environment or company reputation or consequential business loss.
17	Joint Health and Safety Committee	The Occupational safety and Health Act 2004 as amended 2006 states that every employer shall establish a safety and health committee once there are twenty five (25) or more persons employed at the establishment. This committee comprises of representatives of management, employees and the union. Their core function includes reviewing, investigating and resolving all matters involving the safety and health of employees
18	Lockout/Tag out	<p>Lockout is a technique used to prevent equipment from being accidentally started and stored chemicals from being released while an associated machine or piece of equipment is being serviced. A padlock or any other appropriate mechanical device that physically prevents the release of chemicals is placed on the device that should be in the off or closed position. Types of Lockout Devices include:</p> <ul style="list-style-type: none"> • Disconnect switches • Circuit breakers • Slide gates • Valves (ball, gate, etc.) • Blocks • Blind flanges <p>A tag is also placed together with the locking device, to explain why the equipment is locked, by whom and for how long.</p>
19	Lost Work Days	The number of work days (consecutive or not) beyond the day of injury or onset of illness during which the employee was away from work and/or limited to restricted work because of an occupational injury or illness

Item No.	Word/Phrase	Definition
20	Lux	One lumen per m ² . It is a measure of the flow of luminous flux from the source
21	Major Injury	This shall constitute: (a) Fractures (b) Amputations (c) Loss of sight (d) Any other injury requiring hospitalization as an in-patient for twenty four (24) hours except where the person is detained only for observation with no medical treatment given and/or no illness recognized
22	Management System	A structured set of measures taken or recommended to achieve an initially defined result, guaranteeing stability and implementing a process of continual improvement.
23	Near Miss	An incident in which an accident was avoided. It did not result in an actual loss but had the potential to do so.
24	Oxidizing Materials	Chemicals which will decompose readily under certain conditions to yield oxygen. They create a fire hazard in the presence of combustible material
25	Restricted Work Area Activity	(a) Assigning the employee to another job on a temporary basis. (b) Less than full time work (c) Working full time on the job but not being able to perform all the duties normally connected with it.
26	Risk	The variation in the possible outcomes that exists in a given situation. Pure risks exist when there is a chance of loss but no chance of gain. They are generally repeatable under essentially the same set conditions and thus are amendable to the law of large numbers
27	Standard Operating Procedures (SOPs)	A written instruction document which describes how regularly occurring activities are performed correctly and in the same manner. It outlines step by step what should be done in order to achieve the expected objective.
28	Substance Abuse	The inhalation, ingestion, injection or absorption of any substance into body, without the prescription of a licensed Medical Practitioner for a legitimate disorder, which can alter or impair the responses of the central nervous system. These substances include, but are not limited to: Cocaine, alcohol, barbiturates, Librium, amphetamines, valium,

Item No.	Word/Phrase	Definition
		marijuana, Quaaludes, opiates, PCP, methadone, any counterfeit drugs, any designer drugs, any obsolete prescription drugs
29	Supervisor	Any person who has the responsibility for subordinates
30	Threshold Limit Values (TLV)	The values issued by the American Conference of Government and Industrial Hygienist (ACGIH) for air borne toxic materials used as guides in the control of health hazards. They represent concentrations to which nearly all workers may be exposed for eight hours per day over extended periods of time without adverse effects
31	Toe Board	A vertical barrier at floor level erected along exposed edges of a floor opening, wall opening, platform, runway or ramp to prevent fall of materials
32	Toxicity	An intrinsic property of any solid, liquid or gas that can produce injuries or lethal effect upon contact with body cells

