DEPARTMENT OF WATER AND SANITATION

NO. 6292 **6 June 2025**

WATER SERVICES ACT, 1997

REVISED COMPULSORY NATIONAL WATER AND SANITATION SERVICES STANDARDS IN TERMS OF SECTION 9 (1) OF THE WATER SERVICES ACT, ACT NO 108 OF 1997

I, Miss Pemmy P.C. Majodina, in my capacity as the Minister of Water and Sanitation, hereby in terms of section 9(1) of the Water Services Act, 1997 (Act No. 108 of 1997), prescribe revised Standards as contained in the schedule hereto.

MISS PEMMY C. P. MAJODINA, MP
MINISTER OF WATER AND SANITATION
DATE 16/04/2025

SCHEDULE

COMPULSORY NATIONAL WATER AND SANITATION SERVICES STANDARDS

COMPULSORY NATIONAL WATER AND SANITATION SERVICES STANDARDS

Definitions

1. In these Regulations, a word or expression to which a meaning has been assigned in the Act bears that meaning, and must be read in conjunction with the principal Act, unless the context otherwise indicates —

"asset management" means the combination of management, financial, economic, engineering, and other practices applied to physical assets with the objective of providing the required level of service in the most cost-effective manner. It includes the management of the whole life cycle (design, construction, commissioning, operating, maintaining, repairing, modifying, replacing and decommissioning/disposal) of physical and infrastructure assets.

"basic sanitation service" means the provision of a basic sanitation facility which is environmentally sustainable, easily accessible and affordable to a household and a consumer, the sustainable operation and maintenance of the facility, including the safe removal of human waste, greywater and wastewater from the premises where this is appropriate and necessary, and communication and local monitoring of good sanitation, hygiene and related practices.

"basic water supply" means the prescribed minimum standard of water supply services necessary for the reliable supply of a sufficient quantity and quality of water to households, , to support life and personal hygiene.

"**bucket toilet"** means the use of a bucket (or similar removable container) located under a toilet seat which is used to retain untreated human excreta until the bucket is removed for disposal of its content. The bucket is normally placed in a temporary or permanent structure located away from the dwelling.

"communal toilets" means toilets that are shared by a group of households in a community. In some cases, each household will have a key to one of the toilets within a block, single building or property. This may be one toilet per household, or one toilet for a group of households.

"competency" means the qualifications, experience, skills and knowledge that are required to perform a job effectively.

"Consumer" as defined in the Act.

"Decentralised Wastewater Treatment (DWWT) or Decentralised Wastewater Treatment System (DWWTS) refers to various approaches for collection, treatment, and dispersal/reuse of wastewater for individual dwellings, industrial or institutional facilities, clusters of homes or businesses, and entire communities. They provide a range of treatment options from simple, passive treatment with soil dispersal, commonly referred to as septic or on-site systems, to more complex and mechanized approaches such as advanced treatment units that collect and treat waste from multiple buildings and discharge to either surface waters or the soil. They are typically installed at or near the point where the wastewater is generated. These systems, when owned by the WSA and or its contracted Water Service Provider or Water Services Intermediary, as a part of their permanent infrastructure, can be managed as stand-alone facilities. These systems, when privately owned will need to be managed as stand-alone facilities by the infrastructure owners, operating as a Water Services Intermediaries with an SLA to the municipality and a water use authorisation in terms of the National Water Act."

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"drinking water" means water that is intended for human consumption; food preparation and personal hygiene with acceptable health risk compliant to SANS 241.

"drinking water quality advisory notice" means either a Boil Water Notice which is issued by a Water Services Authority when the quality of drinking water poses a health risk which can be adequately addressed by additional household treatment prior to human consumption, or a Do Not Use Water Notice which is a notice issued by the Water Services Authority when the quality of drinking water poses a health risk for human consumption and food preparation which cannot be adequately mitigated by means of additional household treatment.

"effluent" means human excreta, domestic sludge, domestic wastewater, greywater or wastewater resulting from the commercial or industrial use of water that has been treated to standards issued under the National Water Act prior to discharge.

"faecal sludge" means the contents emptied from an on-site sanitation system, and not transported by sewers, including liquid and solid contents of on-site systems such as container-based vaults, pit-latrines, septic tanks, community toilets, or mobile toilets.

"Faecal sludge management" means the management of faecal sludge from containments, emptying /collection, transport, treatment and disposal or reuse.

"greywater" means wastewater resulting from the use of water for domestic purposes but does not include human excreta.

"High, medium and low-density formal settlements" is described in the Human settlement Neighbourhood Planning and Design Guide (the Red Book)

"Infrastructure Leakage Index (ILI)" performance indicator of real (physical) water loss from the supply network of water distribution systems.

"incident" means a significant deviation in operational monitoring or in verification compliance results where a critical limit is exceeded . An incident is any situation where there is a reason to suspect that water that is supplied for drinking is or may become unsafe posing potential health risk to consumers.

"**indigent households**" households lacking the necessities of life as defined by the Indigent Policy of National Treasury.

"**informal settlement**" means human settlement areas that do not comply with municipal town planning scheme requirements.

"**Integrated Regulatory Information System**" (IRIS) means the national integrated regulatory information system of the Department where various reports and data required in these standards must be uploaded to. The system can be accessed at https://ws.dws.gov.za/IRIS/mywater.aspx. For assistance the IRIS helpdesk can be contacted at greendrop@dws.gov.za or Bluedrop@dws.gov.za

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"interim sanitation services" means an interim measure in informal settlements to provide privacy to the consumer, is safe, readily accessible, within specified walking distance and provides for the safe disposal of human excreta, including hygiene and End-user Education.

"interim water services" means the provision of people's basic domestic needs for drinking water, living in informal settlements, at a minimum level through providing water at regular intervals to ensure increased opportunities for improved health.

"**ISO 31800**" means the international standards for faecal sludge treatment unit which serves 1000 to 100 000 people or 200 to 20 000 households.

"job" means the basic duties, functions, tasks, competency requirements and responsibilities according to which one or more posts of the same grade are established.

"**non-revenue water (NRW)**" means the volume of water supplied by the Water Services Institution, but for which it receives no income.

"non-sewered sanitation (NSS) or non-sewered sanitation system (NSSS)" means a system that is not connected to a network sewer, and collects, conveys, and fully treats the specific input to allow for safe re-use or disposal of the generated solid output or discharge of effluent.

"Off-grid sanitation systems" means on-site sanitation options such as Non-Sewered Sanitation Systems (NSSS) and Decentralised Wastewater Treatment Systems (DWWTS).

"on-site sanitation" means a sanitation system in which excreta or wastewater is stored, collected and / or treated where they are generated in accordance with (e.g., on the property, community or in the household) this may include gravity sewers, settled sewers or simplified sewer systems.

"process audit" means a comprehensive assessment of designs which include structural, electrical and mechanical integrity in faecal sludge treatment plants, water- and wastewater treatment works, network and pumpstations to determine process effectiveness and adherence to design specifications.

"process condition assessment" means assessment of a faecal sludge treatment plants, water or wastewater infrastructure which involves evaluating the physical and operational status of the system that entails examining the physical condition of the infrastructure, such as unit processes, equipment, pipes, machinery, pumps, and valves to ensure it is functioning properly and efficiently. This assessment helps in identifying any potential risks or unit processes, equipment that require maintenance or upgrades.

"sanitation service chain" means human excreta captured, contained (pit or tank), emptied, transported (of sludge), treatment, beneficial use or safe disposal of faecal sludge.

"**shared toilet**" means toilets that are shared between a group of households in a single building or on a single plot.

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"public place" means any location that is maintained by the government for the use of the public.

"SANS 241" means the South African National Standard for drinking water quality (as may be updated).

"SANS 10252" means the South African National Standard for water supply and drainage for buildings.

"SANS 10254" means the South African National Standard for installation of fixed electric storage water heating systems.

"SANS 30500" means the South African National Standard for non-sewered sanitation systems.

"supply zone" means an area, determined by a Water Services Authority, within which all the consumer connections are provided with water supply services from the same pressure zone linked to a reservoir or a direct bulk supply point with a pressure reduction value.

"the Act" means the Water Services Act, 1997 (Act No. 108 of 1997), as amended.

"the Department" means the Department of Water and Sanitation (DWS).

"the National Water Act" means the National Water Act, 1998 (Act No. 36 of 1998).

"user connection" means a connection through which a consumer can gain access to water services or connect to sanitation services and includes a consumer installation and a bulk or communal connection.

"user sector" means the applicable category of users, being users categorised into at least either—
(a) domestic.
(b) industrial; or
(c) commercial sectors.

"wastewater" means water from the domestic, commercial or industrial use of water containing waste or water that has been in contact with waste material.

"water balance" means the standard framework for evaluating the System Input Volume, the authorised consumption, water losses and Non-Revenue Water in municipal distribution system as described in the DWS guideline for the preparation of an IWA water balance to determine Non-Revenue Water and water losses (Annexure B).

"wastewater risk abatement plan (W_2RAP)" means a systematic process that aims to consistently ensure acceptable wastewater quality that does not exceed the stipulated numerical limits in licences or permits by implementing an integrated water quality management plan, which includes a risk assessment and risk management approach from wastewater collection, through treatment and discharge to the catchment.

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"water conservation" means the minimisation of loss or waste, the care and protection of water resources and the efficient and effective use of water.

"water demand management" means the adaptation and implementation of a strategy and action plan by a Water Services Institution or consumer to influence the water demand and usage of water to meet any of the following objectives: economic efficiency, social development, social equity, environmental protection, sustainability of water supply and services and political acceptability.

"water efficient device" means a product that reduces the excessive use of water.

"water losses" means water that has been produced (treated by a Water Services Institution) and which is lost before it reaches the consumer. Losses can be real losses (through leaks, sometimes also referred to as physical losses) or apparent losses (for example through theft or metering inaccuracies).

"Water efficient sanitation solutions" (WESS) means sanitation systems which require low to no water, completely off-grid, non-sewered, on-site or are decentralised and utilise technologies that include using water saving devices, water-efficient processes and beneficial use of waste products.

"water safety plan" means a systematic process that aims to consistently ensure safe and acceptable drinking water that does not exceed the numerical limits in SANS 241 by implementing an integrated water quality management plan, which includes a risk assessment and risk management approach from catchment to consumer.

"Water Services Authority" (WSA) as defined in the Act.

"Water Services Intermediary" as defined in the Act.

"**Water Services Provider"** as defined in the Act.

"water supply network" means a network of hydrological and hydraulic components that includes facilities for storage, transmission, treatment and distribution of water from source to consumers, for example, homes, commercial establishments, industry and public facilities.

"water supply system" means an area under jurisdiction of the Water Services Institution within which water intended for human consumption may come directly from a resource, or from one or more water treatment works.

"wastewater treatment system" means the pipes, sewers, pump stations and treatment work that collect, reticulate and treat wastewater from residents, businesses and industries before discharging or re-using the final treated effluent and biosolids.

"wastewater treatment works" means a process, or combination of unit processes, undertaken to render effluent acceptable to return to the environment or for re-use. A wastewater treatment works includes but are not limited to conventional wastewater treatment works, oxidation ponds, package plants and reclamation plants.

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"water treatment works" means a process, or combination of unit processes, undertaken to render raw water safe for drinking purpose. A water treatment works can employ more than one process or only one process such as disinfection. Water treatment works include but is not limited to conventional water treatment plants, package plants, groundwater treatment plants, reclamation plants and desalination plants.

COMPULSORY NATIONAL WATER AND SANITATION SERVICES STANDARDS

PART A: PROVISION OF WATER SERVICES

Basic water supply services

2.(1) A Water Services Authority is responsible for the provision of basic water supply services to all consumers or potential consumers in its jurisdictional area inclusive of people residing on privately owned land as guided by the Water and Sanitation Services Policy on Privately Owned Land (2023) (Annexure B).

(2) The minimum standard for basic water services must consist of -

(a) within two years of promulgation of these regulations an access or delivery point which must be at least at the end boundary of the yard (user connection point) of the existing settlement.

(b) a minimum quantity of drinking water of 6 kl/household per month –

(i) at a minimum flow rate of not less than 10 litres per minute.

(ii) with an effectiveness such that water is made available for at least 358 days per year.

(iii) not interrupted for longer than 48 consecutive hours.

(iv) at no cost to indigent households, upon depletion of the initial 6kl per month allocation, qualifying indigent household will be subject to usage restrictions and will be responsible for payment based on the adopted tariff policy for any additional water consumed.

(c) water provided which complies with the requirements of SANS 241.

(3) Maintenance of the infrastructure up to the user connection is the responsibility of the Water Services Institution and the maintenance of the infrastructure within the boundary of the property is the responsibility of the owner.

(4) All new user applications for water connections must be completed within 21 calendar days by a Water Services Authority in areas where the infrastructure allows or exist.

(5) All user connections for water supply must be metered or measured, controlled and tariffed by the relevant Water Services Institution.

(6) A Water Service Institution must replace stolen meters and or repair or replace damaged meters within 30 days of it being reported or detected.

(7) Water meters must be managed and replaced within their asset lifespan.

(8) The Water Services Institution must ensure the provision of appropriate education in respect of safe, effective and efficient water use, hygiene and groundwater use management.

(9) Within two years after promulgation of these Regulations, Water Services Authority must submit plans to the Department, using the WSDP platform at www.ws.dws.gov.za/wsdp.aspx, as part of their Water Services Development Plan (WSDP) on how they are going to upgrade all consumers in formal settlements to basic services (yard connection; user connection point).

Interim water supply services

3.(1) A Water Services Authority must take reasonable measures to provide interim water supply services in informal settlements.

(2) Upon realisation of a new informal settlement, the WSA must provide interim water supply services within 90 days of becoming aware thereof.

(3) A Water Services Authority is responsible for the capital, operation, maintenance and refurbishment actions and cost pertaining to interim water services.

(4) Where an informal settlement is formalised, a Water Services Authority must ensure access to basic water services.

(5) The minimum standard for interim water services must consist of-

(a) an access or delivery point which must be a communal standpipe, within a reasonable walking distance of no more than 200m from the furthest household.

(b) a minimum quantity of drinking water 6 kl/household per month –

(i) at a minimum flow rate of not less than 10 litres per minute.

(ii) with an effectiveness such that water is made available for at least 358 days per year.

(iii) not interrupted for longer than 48 consecutive hours.

(c) water provided which complies with the requirements of SANS 241.

(6) All areas supplied with interim water supply services must have zonal meters and measured by the relevant Water Services Institution.

(7) Whenever interim water supply services are provided through water tankers, it must not exceed 12 consecutive months and WSAs need to keep accurate records as specified in Regulation 4(3)(c).

COMPULSORY NATIONAL WATER AND SANITATION SERVICES STANDARDS

Interruption of water supply services

4.(1) A Water Services Authority, in agreement with their relevant Water Services Institutions must take reasonable measures to ensure that where water supply is interrupted for a period of more than 48 hours, including where but not limited to an emergency situation is declared, a consumer has access to alternative water supply which—

(a) consists of at least 15 litres of drinking water per person per day; and

(b) is made available at strategically determined points of delivery that are relatively convenient and safe.

(2) Whenever emergency or alternative water supply is provided, the Water Services Institution must ensure that the distributed water is fit for human consumption as per the applicable prescripts of SANS 241 (as prescribed under Regulation 4).

(3) Whenever alternative water supply services are used for provision of drinking water for longer than a week, the water services institution must register a monitoring programme on the Integrated Regulatory Information System of the Department indicating:

(a) the origin of the alternative source(s).

(b) compliance results with specific SANS 241 parameters of disinfectant residuals, turbidity, *E. coli*, Heterotrophic Plate Count, conductivity and pH until distribution by tankering is discontinued.

(c) where tankers are used, Water Services Institutions must keep accurate records of:

(i) Vehicles type and registration and drivers used to provide the service.

(ii) the volumes transported per trip.

(iii) delivery schedule.

(iv) delivery point.

(v) vehicles that are used for provision of other services such as dust suppression where untreated water is not recommended unless the exclusive use for a period can be guaranteed where these vehicles are first cleaned and can achieve the maintenance of the SANS standard. Disinfection and certificate of cleanliness issued by a recognised body.

(vi) use of other vehicles transporting materials or liquids other than water is not permitted to tanker drinking water.

(vii) Above records are to be provided as part of the monitoring system to the Department on a monthly basis.

(viii) Alternatives to tankering for mid and longer term must be prioritised to reduce unsustainable dependencies on tankers.

(4) Whenever water shortages are declared under the National Water Act, the Water Services Institution must impose reasonable limitations on its consumers' water consumption in its water supply network to ensure compliance with written notices issued under Schedule 3, section 6 of the National Water Act.

(5) Water Service Institutions must ensure sufficient reservoirs to meet demand and to minimise effect of water interruptions. WSI must revise the minimum operational levels for their reservoirs to increase storage capacity.

Quality of drinking water

5.(1) Water Services Institution must ensure that the distributed drinking water is fit for human consumption as per the applicable prescripts of SANS 241.

(2) A Water Services Institution must develop and implement a water safety plan for all water supply systems in accordance with the World Health Organization or any equivalent approach to water safety planning.

(3) A Water Services Institution must as a minimum review its water safety plan on an annual basis and or as the risk changes. The revised plan must be submitted to the Minister using the national integrated regulatory information system at https://ws.dws.gov.za/IRIS/mywater.aspx within 30 days of approval by an accounting officer or the person delegated.

(4) A Water Services Institution must develop and implement a monitoring programme to monitor the quality of drinking water supplied to consumers in their water supply system in accordance with the requirements of SANS 241, and such monitoring programme must together with its amendments be provided to the Department on its national integrated regulatory information system (IRIS). This shall include boreholes, static tanks and tankers.

(5) The water quality monitoring programme to be developed in 5(4) must specify points at which drinking water provided to consumers will be sampled, the frequency of sampling and for which parameters the water will be analysed in accordance with ISO 2859 for sampling of water, material, parts, and product.

(6) Samples collected by a Water Services Institution must be analysed in a laboratory using ISO 17025 accredited methodologies for water analysis or a laboratory having systems in place to ensure credibility and reliability of results such as participation in a Proficiency Testing Scheme and demonstrating acceptable results.

(7) The results of the implemented monitoring programme must be reported to the Department on its national Integrated Regulatory Information System within 30 days of sampling or on the request of the Minister.

COMPULSORY NATIONAL WATER AND SANITATION SERVICES STANDARDS

(8) A Water Services Institution must develop and implement an incident management protocol (Annexure A) for the management of non-compliances where the numerical limits in SANS 241 is not met, and categorisation of incidents including communication media for communicating disruptions and incidents requiring the issuance of drinking water quality advisory notice(s).

(a) A Water Services Institution must, within 12 hours of the confirmation of an incident that poses a health risk, inform the Department's relevant Regional Office and the relevant provincial Department of Health's District Health Office of the health risk.

(b) A Drinking Water Quality Advisory Notice must be issued by a WSA when—

(i) a situation has been declared an incident following repeated non-compliant results that indicates a health risk of the sampled water supply.

(ii) a Water Services Institution has reason to believe that the water quality is compromised or is likely to fail to comply with SANS 241 health risks requirements.

(iii) treatment processes fail to adequately treat the water according to the health limits of SANS 241 or

(iv) instructed to do so by the Department.

(c) A Drinking Water Quality Advisory Notice must be issued by the WSA to the affected community/area(s) using appropriate communication in a medium that is accessible to the affected community and or area -

(i) specify the nature of the health risk presented and the affected area or areas.

(ii) indicate rectification measures taken or to be taken by the Water Services Institution.

(iii) indicate risk minimisation measures to be taken by the public.

(iv) specify a reasonable time within which the situation is expected to normalise.

(9) A Water Services Institution must ensure that drinking water quality performance information against SANS 241 are annually made available to the public and are accessible to the relevant stakeholders.

(10) Records of all results and documents must be kept for at least five (5) years by the Water Services Institution and be available at all times for regulatory and audit purposes.

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Basic sanitation service

6.(1) A Water Services Authority is responsible for the provision of basic sanitation services to all consumers or potential consumers in its jurisdictional area inclusive of people residing on privately owned land as guided by the Water and Sanitation services policy on privately owned land (2023).

(2) The standard for basic sanitation services must include the provision of a toilet with functional hand washing facility in the yard , which is safe, reliable for 24 hours a day, environmentally sound, easy to keep clean, provides privacy and protection against the weather, well ventilated, keeps smells to a minimum and prevents the entry and exit of flies and other disease-carrying pests, providing for an effective and acceptable sanitation technology.

(3) A Water Services Authority must ensure that human excreta and wastewater is safely contained at all times, throughout the sanitation service chain.

(4) Faecal sludge management must be an integral part of the sanitation service.

(5) Each household must have uninterrupted access to an adequate, appropriate, sanitation facility.

(6) Hygiene and user education must be an integral part of sanitation service. Households should be supported with knowledge and any other relevant resources to take responsibility for the correct and consistent use of the sanitation service, including but not limited to the toilet facility.

(7) In providing basic sanitation service, a Water Services Authority must consider the following requirements:

(a) The need for everyone, including persons with disability to have a reasonable quality of life.

(b) Water efficient sanitation solutions.

(c) Groundwater pollution risks in accordance with the Protocol to manage the potential of groundwater contamination from on-site sanitation (2003) (Annexure B).

(d) Water use authorisation in terms of the NWA.

(e) Surface water pollution risks and the management thereof.

(f) Population density.

(g) Economies of scale.

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(8) Subject to sub-regulation (7) a Water Services Authority must consider-

(a) in high and medium density formal settlements:

(i) waterborne sewered sanitation provided that the wastewater treatment system and works have adequate capacity and is performing to acceptable standards under the National Water Act (read with regulation 10); or

(ii) alternative water efficient sanitation solutions instead of waterborne sewered systems in areas of dense formal and medium settlement where there is resource scarcity and or inadequate capacity or functionality in the sewer system and or the wastewater treatment works.

(b) in low density or sparsely populated settlements: water efficient sanitation solutions.

(9) Water efficient sanitation solutions in sub-regulation (7) must be shown to include off-grid, on-site sanitation options such as Non-sewered Sanitation Systems (NSSS) as well as Decentralised Wastewater Treatment Systems (DWWTS).

(10) A Water Services Authority may not unreasonably decline a property development to have a water efficient sanitation solution that is not connected to the central system where development will manage the system as a Water Services Intermediary and where the water uses of the system is authorised under the National Water Act.

(11) Whenever a Water Services Institution is providing new innovative non-sewered sanitation systems, such must be guided by the requirements of SANS 30500 for Non-Sewered Sanitation Systems or the "SANS 24521:2020 Guidelines for the management of basic on-site domestic wastewater services", whichever is applicable.

(12) Water Service Authority must monitor and regulate safe emptying, transportation, treatment and disposal of faecal sludge to faecal sludge treatment facilities or any other authorised facility.

(13) Faecal sludge treatment plants must be guided by ISO 31800 for prefabricated units or similar standards for non-prefabricated faecal sludge treatment units.

(14) Water Services Authority must have community participation procedures of informing communities about the emptying processes, routes and health risks.

(15) Within two years after promulgation of these Regulations, the Water Services Authority must submit plans as part of their Water Services Development Plan (WSDP), using the WSDP platform at www.ws.dws.gov.za/wsdp.aspx, on measures to eradicate unimproved pit toilets and open defaecation in human settlements.

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Interim sanitation service

7.(1) A Water Services Authority is responsible for the capital, operation, maintenance and refurbishment actions and cost pertaining to interim sanitation services including the management of faecal sludge in the entire sanitation service chain.

(2) A Water Services Authority must take reasonable measures to provide appropriate interim sanitation services in informal settlements and during a disaster.

(3) Upon realisation of a new informal settlement, the WSA must provide interim sanitation service within 90 days.

(4) Interim sanitation services must provide at least the following:

(a) Communal and shared facilities in accordance with the table below:

Type	Toilet seat	Urinal Units	Hand washing
Communal toilet	1 seat per 10 households	1 unit per 20 households	1 basin per 10 households
Shared toilets	1 unit per 4 households	1 unit per 10 households	1 basin per 4 households

(b) The Water Service Authority must put measures in place to keep the toilets hygienic.

(c) The toilets must be separated according to gender to meet the needs for women, girls and persons with disability.

(d) All portable and mobile toilets must be emptied at least twice a week to appropriate licensed facilities for treatment.

(5) If the sanitation facility is communal, the maximum walking distance should be 100m, wherever possible.

(6) Parents and care givers must be provided with information by the Water Services Institution regarding safe disposal of infant's faeces, laundering practices and use of nappies, potties or scoops for effectively managing safe disposal.

(7) A Water Services Authority through its Environmental Health Practitioners are responsible for promoting hygiene and user education for ensuring an environmentally safe approach to sanitation, and for monitoring the impact of sanitation processes on the environment.

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Sanitation workers' health and safety

8.(1) Water Service Institution must ensure sanitation workers 'safety through the provision of personal protective equipment, facilities to wash with water and soap, vaccination and deworming against diseases relevant to their working conditions.

(2) Water Service Institution must ensure workers are trained on the risks of handling faecal sludge and on standard operating procedures.

Interruption of sanitation services

9.(1) Whenever sanitation service is interrupted for longer than 48 hours, including where an emergency situation is declared, the Water Services Institution must make provision for alternative water for flushing of waterborne sanitation or interim sanitation service.

Sanitation services at public places

10.(1) Sanitation services must be family-friendly, and the following must be provided:

(a) Nappy changing areas.

(b) Hook to assist with hanging handbags; and

(c) Toilets must include provision for appropriate disposal of menstrual materials (waste bins with lid that are emptied regularly).

(2) Provision must be made for sanitation facilities for persons with disabilities in adherence to the requirement set out in the SANS 10400-S:2011.

Prohibitions

11.(1) The provision or distribution of bucket toilets to communities in both formal and informal settlements are prohibited.

(2) Municipalities and WSAs are prohibited from approving bulk user connections to existing water and wastewater systems without having the necessary capacity to service such user connections. This means that a municipality may not approve new /additional bulk user connections to an existing water or wastewater treatment system unless that system has the capacity to deal with the additional load (ability to operate according to technical specifications).

(3) Municipalities may not approve any new developments that will connect to an existing wastewater treatment system unless such a system has the capacity to deal with the load from the development.

COMPULSORY NATIONAL WATER AND SANITATION SERVICES STANDARDS

PART B: THE QUALITY OF WATER DISCHARGED INTO SANITATION COLLECTION SYSTEMS OR A WATER RESOURCE

Greywater management

12.(1) A Water Services Institution planning to separate, collect and use greywater beyond the boundary of a household for any purpose must ensure such risks are identified in the wastewater risk abatement plan in accordance with regulation 13(2) and managed accordingly.

(2) The Guidelines for Greywater Use and Management in South Africa, Water Research Commission (2018) (Annexure B) must be used to assist in the identification of risk in sub-regulation (1).

Sewer collection, wastewater treatment and faecal sludge management

13.(1) The Water Services Authorities must in its Water Services Development Plan —

(a) determine actual and forecasted wastewater generation within its service areas.

(b) plan for adequate sewer collection, wastewater treatment capacity and water efficient sanitation.

(c) determine actual and forecasted faecal sludge accumulation in containment (pits / tanks) within its serviced areas.

(d) plan for a safe faecal sludge emptying, transportation, treatment and disposal or beneficial use method.

(2) A Water Services Institution responsible for the collection and treatment of wastewater and faecal sludge, must ensure that the environmental risks are identified, and climate resilient sanitation safety plans (SSP) and a wastewater risk abatement plan (W_2RAP) are developed and implemented accordingly.

(3) The sanitation safety plans, and a wastewater risk abatement plan must be developed in accordance with the WHO manual and guidelines (2018 and 2022) and W_2RAP Guideline, Water Research Commission (2011) (Annexure B), and must be reviewed every two years as a minimum. The revised plan must be submitted to the Minister using the national integrated regulatory information system within 30 days of approval by an accounting officer or the person delegated.

(4) Faecal sludge management infrastructure, and its maintenance as well as safe disposal of human waste must be carried out on a regular basis, as frequent as necessary to maintain hygiene, in a safe and acceptable manner by the Water Service Authority.

(a) WSA must schedule emptying of full containments (including pits / tanks) for on-site sanitation.

(b) All identified or reported full containments (including pits / tanks) for on-site sanitation outside the schedule must be emptied within 10 days to the appropriate treatment facility.

(c) Where containments (including pits / tanks) are treated chemically or biological to prolong use and proper functioning, such chemical or biological measures must not be harmful to the health of the users, the water resource or the environment and must adhere to its label applications.

(d) All emptied faecal sludge must be transported to an appropriate and authorised faecal sludge treatment plant or any other treatment facility for treatment, beneficiation or disposal (subject to a water use authorisation). WSA shall keep record of volumes faecal sludge transported and coordinates of treatment facilities used and/or disposal sites.

(e) ensure that faecal sludge emptying services are conducted in compliance with the Hazardous Biological Agents Regulations (2001) (Annexure B) under the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993); and

(f) ensure that the transportation of faecal sludge complies with the National Road Traffic Act, 1996 (Act No. 93 of 1996) and its regulations.

(5) Faecal sludge must be treated and analysed for beneficiation suitability in accordance with WRC Guidelines for Utilisation and Disposal of Wastewater Sludge, 2009 (Volume 1-5) (See Annexure B). Should the sludge not be viable for beneficiation, it must be disposed in accordance with the National Environmental Management: Waste Act and its regulations and the National Water Act.

(6) Annual sewer and faecal sludge collection inspections and treatment process audits are required as part of the wastewater asset management process.

Quantity and quality of industrial wastewater collected into a sewerage system

14.(1) A Water Services Institution must only accept the quantity and quality of industrial wastewater or any other substance into a sewerage system that the sewage treatment works linked to that system is capable of purifying or treating to ensure that any discharge to a water resource complies with the required authorisation and standard prescribed under the National Water Act.

(2) A WSA shall prescribe pre-treatment of any effluent to the required standard its wastewater treatment systems can process prior to it being disposed into municipal infrastructure.

COMPULSORY NATIONAL WATER AND SANITATION SERVICES STANDARDS

Control of objectionable substances

15.(1) A Water Services Institution must take reasonable measures to prevent any substance other than uncontaminated storm water to enter—

(a) a storm water drain; or

(b) a watercourse, except in accordance with the provisions of the National Water Act.

(2) The water Services Institution must ensure that inlets of stormwater drains are able to transport water whilst preventing litter or other objectionable substances from entering the stormwater. Such inlets must be regularly cleared and maintained to ensure proper drainage and removal of objectionable substances.

(3) A Water Services Institution must take measures to prevent storm water from entering its sewerage system.

(4) WSA must take measures including consumer awareness to prevent foreign objects being disposed in municipal sanitation infrastructure

PART C: THE EFFICIENT AND SUSTAINABLE USE OF WATER

Water conservation and water demand management (WCWDM)

16.(1) Where spillages or leaks in its water supply network are detected or reported, a Water Services Institution must record such cases and ensure that they repair all leaks within 48 hours of becoming aware thereof.

(2) A Water Services Institution must isolate 95% of detected or reported water pipe bursts in its water supply system within a maximum of four (4) hours of becoming aware thereof.

(3) Where spillages or sewer blockages in its wastewater collection network are detected or reported, a Water Services Institution must record such cases and ensure that they are contained and must be repaired within 24 hours of becoming aware thereof. The affected surface area must be cleaned and or disinfected.

(4) A Water Services Institution must have a 24-hour consumer care facility supported by the system to which leaks, spillages or water services related enquiries and complaints can be reported, and feedback be given to the consumer.

(5) Whenever emergency or alternative water supply is provided in terms of Regulation 4(1), the Water Services Institution must ensure that taking of water from bulk line if applicable is appropriately metered and recorded (i.e. if alternative water is provided through tankering the number of tankers and their volume must be recorded when taking from a bulk metered pipeline.

COMPULSORY NATIONAL WATER AND SANITATION SERVICES STANDARDS

(6) A Water Services Institution must implement a Pressure Management Programme allowing water reticulation systems to be operated at a minimum pressure of 20m and maximum pressure of 90m.

(7) Where water pressure in a water reticulation system could rise above 90m, a Water Service Institution must install a pressure control device to prevent the pressure at any domestic consumer connection from rising above 90m.

(8) A Water Services Institution must take steps to measure and progressively reduce losses, maintain the water use efficiency Key Performance Indicators including the quantity of water losses, the quantity of Non-Revenue Water, Infrastructure Leakage Index and per capita Usage to within international accepted standards as follows:

(a) Non-Revenue Water, 20-30%.

(b) Water Losses, 10-20%.

(c) Infrastructure Leakage Index, 2-4; and

(d) *Per Capita* Usage, 120-180 l/c/d.

(9) Water Services Institutions must develop and implement a 10-year Council approved WCWDM Strategy and an Annual Plan within 6 months of the publication to be uploaded on the IRIS system and must consist of at least the following:

(a) Situation Assessment.

(b) Key issues and Challenges.

(c) Focus Areas of Interventions.

(d) List of proposed interventions.

(e) Set targets for demand, Non-Revenue Water, water losses (commercial and real losses), infrastructure leakage index, and per capita usage in line with subsection 8 above; and

(f) Budgets and Multi –year Implementation timelines.

(10) WSAs must require greenfield developments or major brownfield redevelopments, prior to planning approval, to indicate the manner and extent in which water conservation and water demand management (WCWDM) and water efficient sanitation solutions (WESS) has been accommodated and accounted for in their selected technology options, in terms of efficient water use and off-grid sanitation.

COMPULSORY NATIONAL WATER AND SANITATION SERVICES STANDARDS

PART D: CONSTRUCTION AND FUNCTIONING OF WATER SERVICES WORKS AND CONSUMER INSTALLATIONS

Water and wastewater balance analysis and determination of water losses

17.(1) A Water Services Institution must install and monitor appropriate water measuring devices or volume controlling devices to measure, detect and account for the volume of water abstracted (surface or groundwater), treated, and consumed, as applicable to the technical configuration of infrastructure and the water use authorisation conditions.

(2) A Water Services Institution must install and monitor appropriate water measuring devices or volume controlling devices to measure, detect and account for the volume of water consumed at all user connections as applicable to the technical configuration of infrastructure.

(3) A Water Services Institution must install and monitor appropriate measuring devices or volume controlling devices to measure, detect and account for the volume of wastewater received at pump stations and the inlet of the wastewater treatment works. A WSA shall record minimum night flows, peak wet weather flow and average dry weather flow received at the inlet of a wastewater treatment work received from all user connections conveyed, as applicable to the technical configuration of infrastructure and the water use authorisation conditions.

(4) A Water Services Institution must install and monitor appropriate measuring devices or volume controlling devices to measure, detect and account for the volume of wastewater discharged into the water resource as applicable to the technical configuration of infrastructure and the water use authorisation conditions.

(5) A Water Services Institution must ensure that all measuring devices or meters are properly maintained and in good working order, implementing a programme for meter – In-situ-verification and/or calibration.

(6) A Water Services Institution must account for its water balance on a monthly basis as follows:

(a) measure the daily volume abstracted and treated; and

(b) measure the quantity of water provided to each supply zone within its supply area.

(7) A Water Services Institution must account for its wastewater balance on a monthly basis as follows:

(a) daily inflows in Ml/d; and

(b) daily outflows in Ml/d.

(8) A Water Services Institution must determine the quantity of water losses and non-revenue water in accordance with the Guideline for the Preparation of an IWA Water Balance to Determine Non-revenue Water and Water Losses (Annexure B).

(9) The results of the water balance analysis and the records of the quantities of water measured as set out in sub-regulation (5) must be reported to the Department's National Regulatory Information Management System on a quarterly basis.

Groundwater Development as a water resource community water supply

18. A Water Services Institution must ensure that during the development of groundwater as a community water supply source, all water use requirements and standards are adhered to under the National Water Act and as prescribed in the DWS "Standard Operating Procedures for Groundwater Source Development for Community Water Supply Projects" 2023 (Annexure B).

PART E: THE NATURE, OPERATION, SUSTAINABILITY, OPERATIONAL EFFICIENCY AND ECONOMIC VIABILITY OF WATER SERVICES

Human resource planning

19. A Water Services Institution must determine the staff establishment necessary to perform the water services functions in compliance to these standards and the Process Controller Regulations (GN 3630, June 2023) (Annexure B), read together with GN 890 Local Government Municipal Staff Regulations and GN R 493 Municipal Regulations on Minimum Competency Levels, 2007 with reference to:

(a) The number of staff members required.

(b) The minimum competencies required (read together with the WRC report (2015) on water sector skills (Annexure B)

(c) Plan for the recruitment, retention and development of staff members according to these regulatory requirements and the Engineering Council of South Africa (ECSA) and South African Council of Natural Scientific Professions (SACNASP) guidelines.

Competency requirements for the Head of a Water Services Authority, and Heads for water and sanitation planning, water and sanitation infrastructure provision, operations and maintenance of water services

20.(1) A person appointed to Head up the Water Services Authority function, the Water Services Provision function, and Operations and Maintenance, the Water Services Planning Unit, Unit in a Water Services Institution must –

(a) Have the necessary competencies; and

(b) Comply with the minimum requirements for education qualifications and work experience as set out in the table below:

COMPULSORY NATIONAL WATER AND SANITATION SERVICES STANDARDS

Table 1: Qualification, years' experience and Statutory registration requirements for all

Qualification, years' experience and Statutory registration requirements for all
Engineering degree (BEng/BSc Eng/B-Tech). For category A municipalities: 15 years post qualification experience in Water and Sanitation Services with registration as a professional engineer / technologist required For a category B municipality: 10 years post qualification experience in Water and Sanitation Service with registration as a professional engineer / technologist required For category C municipalities: 10 years post qualification experience in Water and Sanitation Services with registration as a professional engineer / technologist required

(2) Should a staff member who was appointed before these Standards came into effect have the necessary qualification but not have the necessary competencies or registrations, the Water Services Institution must place the staff member on a programme to acquire the competency requirements as prescribed, if successful completion of such programme will yield achievement of the minimum requirements set within a reasonable time of 5 years of publication of these Standards.

(3) Where the staff member does not have the minimum qualifications, the Water Services Institution must, based on a competency assessment, determine an alternative placement for the affected staff member to enable the recruitment of staff members with the necessary competencies within 2 years of publication of these Standards.

Management of electricity supply for water services

21.(1) To ensure sustainable provision of electricity supply for water service provision, a Water Service Institutions must -

(a) make provision for the installation and operation of diesel generators or similar within their critical water and wastewater system infrastructure to ensure continuation of operations when there is power supply disruption.

(b) alternative sources of electricity must be developed, which may include but are not limited to faecal and wastewater sludge conversion to biogas, off-take agreements with independent power producers or embedded generators or through direct ownership; and

(c) such infrastructure as well as the power supply must be safeguarded against vandalism and theft.

(2) Where electricity is supplied from municipality, Water Boards and Water Services Authorities must, where practically possible and through municipal electricity departments, isolate water and sanitation infrastructure.

(3) Should a water service institution be exempted from loadshedding and the exemptions from loadshedding attracts penalties or extra charges, Water Boards and Water Service Authorities must request exemptions from such penalties or extra charges.

(4) Water Service Authorities must develop integrated response plans to maintain drinking water and wastewater service standards during power disruptions addressing the measure listed in the sub -regulation above.

(5) The integrated response plans referred to in sub-regulation 4 must be across the water and sanitation, electricity, and other divisions of the Water Service Authority.

Maintenance, operations and repairs of water treatment works and water supply network

22.(1) The water system must be serviced by a competent maintenance team, executing the maintenance work according to an acceptable maintenance plan and schedule.

(2) A Water Services Institution must keep a logbook with maintenance entries as per the maintenance plan per system.

(3) Where a water treatment works is being upgraded or constructed the Water Services Institution must ensure the development of an operation and maintenance manual and standard operating procedure for the infrastructure before such infrastructure is handed over to the Water Services Institution.

(4) A Water Services Institution must document the design capacity of the water treatment works and the works must be operated within the authorised abstraction volume or as per the application submitted to the Department for authorisation under the National Water Act. Read together with standard operating procedure for ground water where applicable.

(5) A water treatment works must be subjected to:

(a) an annual process condition assessment.

(b) Process Audit (which will address that year's process condition assessment) in a three-year cycle to inform functionality of the water supply system infrastructure. Risk findings must be incorporated into the Water Safety Plan.

(6) The Department's maintenance management standard for immovable assets (2017) (Annexure B) must be used as a benchmark for water supply services operations.

Maintenance, operation, and repairs of wastewater treatment system

23.(1) The wastewater treatment system (both mechanical and electrical) must be serviced by a competent maintenance team, executing the maintenance work according to an acceptable maintenance plan and schedule.

(2) A Water Services Institution must keep a logbook with maintenance entries as per the maintenance plan per system.

(3) Where a wastewater treatment works is being upgraded or constructed the Water Services Institution must ensure the development of an operation and maintenance manual and standard operating procedure for the infrastructure before such infrastructure is handed over to the Water Services Authority.

(4) Operation and maintenance services are linked to the level of services selected to a settlement or part of a settlement. The following operations and maintenance guidelines developed must be utilised and used as a benchmark for sanitation services operations:

(a) Water borne sanitation operations and maintenance guide, Water Research Commission (2011) (Annexure B); and

(b) Maintenance management standard for immovable assets (2017) (Annexure B).

(5) A Water Services Institution must document the design capacity (hydraulic and organic) of the wastewater treatment works and the facility must be operated within the authorised volume and conditions as required and stipulated under the National Water Act.

(6) A wastewater treatment works must be subjected to an annual process condition assessment and Process Audit (which will address that year's process condition assessment) in a three-year cycle to inform functionality and performance of the wastewater system infrastructure including the sewer reticulation network and pump station(s). Risk findings must be incorporated into the wastewater risk abatement plan (W_2RAP) as stipulated in regulation 13(2).

Operation and maintenance budget and costing

24.(1) A Water Services Institution must determine the actual operations and maintenance cost of water treatment and supply (reticulation) per water supply system and express this in R/m^3. This determination must include –

(a) energy use for treatment and pumping.

(b) compensation of employees.

(c) chemical costs; and

(d) maintenance cost.

(2) A Water Services Institution must have a cost reflective Operation and Maintenance budget per water supply system for water treatment and supply (reticulation) and wastewater system (collection and treatment).

(3) A Water Services Institution may define specific on-site sanitation components of a basic sanitation facility that will remain the responsibility of the household for maintenance and repair.

COMPULSORY NATIONAL WATER AND SANITATION SERVICES STANDARDS

Water and sanitation services infrastructure management

25.(1) A Water Services Authority must ensure that all water and sanitation infrastructure are planned for the full life cycle, and that all life-cycle elements and costs are considered and must be in accordance with the Water Services Infrastructure Asset Management Strategy (2011) (Annexure B).

(2) Asset management must be proactive, on-going, and entrenched in the responsibilities of the water service providers.

(3) Asset Management Plans and registers must be developed by water services authorities and water services providers and be included in the Water Services Development Plans.

(4) A Water Services Authority must—

(a) establish a Water and Sanitation Asset Management Team.

(b) establish levels of service and key performance indicators in line with these standards.

(c) create a detailed inventory to component level of water and sanitation assets.

(d) design a risk assessment programme, considering water and sanitation assets to be managed and how they might fail.

(e) establish the remaining useful life of water and sanitation assets.

(f) record all breaks and failures, including leaks.

(g) for underground water and sewer pipelines, conduct a pipe replacement analysis or study to determine a multi-year replacement budget.

(h) gauge the current condition of water and sanitation assets through condition assessments as set out in Regulations 22(5) & 23(6).

(i) plan and budget for refurbishment and upgrading.

Water services audit as a component in the Water Services Development Plan

26.(1) A Water Services Institution must include a water services audit in its annual report on the implementation of its water services development plan required in terms of section 18(1) and (2)(a) of the Act, which must also be submitted to the department, using the WSDP platform at www.ws.dws.gov.za/wsdp.aspx, on an annual basis, within 4 months after the end of each municipal financial year.

(2) A water services audit must assess compliance to these compulsory Standards and must as a minimum, contain the following details:

(a) The quantity of water services provided which must include at least—

(i) the quantity of water used by each user sector.

(ii) the quantity of water provided to the Water Services Institution by another Water Services Institution.

(iii) the quantity of wastewater received at sewage treatment works.

(iv) the quantity of wastewater not discharged to wastewater treatment works and approved for use by the Water Services Institution.

(v) the quantity of faecal sludge received at faecal sludge treatment works and beneficiated.

(vi) the quantity of faecal sludge disposed and the coordinates on the disposal site.

(b) The levels of services rendered which must include at least—

(i) the number of user connections in each user sector.

(ii) the number of households provided with water through communal water services works.

(iii) the number of consumers connected to a water reticulation system where pressures rise above 90m at the consumer connection.

(iv) the number of households provided with sanitation services through consumer installations connected to the sewerage system.

(v) the number of households with access to basic sanitation services.

(vi) the number of new water supply connections.

(vii) the number of new sanitation connections.

(viii) the number of on-site sanitation systems in each user sector.

(ix) the number of households provided with onsite sanitation through communal facilities.

(x) the type of onsite sanitation systems.

(xi) the number of new onsite sanitation systems provided.

(xii) the number of sanitation systems with full containments (tanks or pits).

(c) The numbers provided in compliance with sub-regulation (2)(b) must be expressed as a percentage of the total number of connections or households.

(d) A record of all water measuring devices installed (including Bulk, Zonal, District, and Consumer meters) and water measuring devices tested must include at least—

(i) the number of new measuring devices installed.

(ii) the number of measuring devices tested (in-situ-verification).

(iii) the number of measuring devices replaced expressed as a percentage of the total number of meters installed on an annual basis.

(e) The water quality sampling programme required under regulation 5(4), the results of the comparison set out in regulation 5(5) and any non-compliance reported as required under regulation 5(6).

(f) Water conservation and water demand management must include at least—

(i) the results of the water balance as set out in regulation 17.

(ii) the total quantity of water losses and non-revenue water.

(iii) the demand management activities undertaken.

(iv) measures implemented to reduce water losses and non-revenue water.

(v) the progress made in the installation of water efficient devices; and

(vi) performance measured against key performance indicators.

(g) A Water Services Institution's compliance status to regulation 20(2) and 20(3) and progress of implementation toward achieving compliance.

(h) The integrated response plan to mitigate the adverse impact of electricity supply on critical water services infrastructure.

(i) Evaluation of efficacy of measures implemented to address risk findings from the annual condition assessment and three-yearly process audits as required for water treatment works and the water supply network (sub-regulation 22) and the wastewater system (sub-regulation 23).

(j) A Water Services Institution must provide evidence of the operations and maintenance expenditure per annum which must be measured in relation to the original budget contemplated in regulation 24(2).

COMPULSORY NATIONAL WATER AND SANITATION SERVICES STANDARDS

Compliance

27. Water Services Authority may identify provisions where immediate compliance cannot be achieved and develop a plan detailing how compliance will be achieved progressively. This must be submitted on the Integrated Regulatory Information Management System for consideration and approval by the Department within 6 months of the publication of the regulations.

Offences

28. The following provisions are considered offences under the Water Services Act and its provisions on penalties:

(a) any prohibitions provided under section 11

(b) failure to issue advisory notices on failures on drinking water (section 5)

(c) failure to adhere to or provide plans required under sections 2(9), 6(15), 16(9), 20, 26(1), and 27

(d) Failure to dispose faecal sludge at an authorised treatment facility (Section 13 (4)(d)).

Repeal of regulations

29. The Regulations relating to compulsory national standards and measures to conserve water published by General Notice Regulation 509 of 8 June 2001 are hereby repealed.

Short title

30. These Regulations are called the Compulsory National Water and Sanitation Services Standards, 2024.

ANNEXURE A

INCIDENT MANAGEMENT PROTOCOL FOR DRINKING WATER QUALITY FAILURES

In the Department's Drinking Water Quality Framework (Annexure B), a Failure Response Model (including an Incident Management Protocol) is provided for dealing with drinking water quality failures

WSIs must ensure that the latest SANS standards are utilised to be read with the protocol.

DRINKING WATER QUALITY INCIDENT AND EMERGENCY PLANNING

Emergency protocols and communication plans are essential during a drinking water failure to ensure that key stakeholders are kept fully informed, and the roles and responsibilities of individuals and organisations are clearly outlined to avoid miscommunication and duplication of effort. Proper emergency planning also allows timeous interventions to be taken to rectify the situation and ensures that affected communities are properly informed and have alternative safe drinking water during the problem.

Incident and emergency response protocols should be regarded as a priority with necessary resources committed to developing emergency response plans. The development of an appropriate plan involves a review of the hazards and events that can lead to emergency situations, including:

- accidents which increase levels of contaminants (for example, spills in catchment, incorrect dosing of chemicals).
- leaks in the distribution system where negative pressures are experienced during low flow periods.
- equipment breakdown and mechanical failure.
- prolonged power failures.
- extreme weather events (for example flooding), and
- human actions (for example strikes resulting in lack of control of the treatment plant).

Key areas to be addressed in incident and emergency response plans include clearly specified:

- response actions including increased monitoring.
- responsibilities and authorities internal and external to the organization.
- plans for emergency water supplies.
- communication protocols and strategies including notification procedures (internal, regulatory body, media and public); and
- mechanisms for increased health surveillance.

Training in emergency response is important to ensure that employees have the skills and knowledge to effectively manage any potential incidents and/or emergencies. Incident and emergency response plans, particularly communication protocols should be regularly reviewed and practiced improving preparedness. Change control should be diligently exercised when personnel join or leave each organization.

Following any incident/emergency situation, an investigation of the incident and/or emergency should be undertaken and a debriefing with all involved staff should be conducted to discuss performance and address any issues or concerns.

INCIDENT MANAGEMENT PROTOCOL FOR DRINKING WATER QUALITY FAILURES

Appropriate documentation and reporting of the incident/emergency should also be established. The organization should learn as much as possible from the incident to improve preparedness and planning for future incidents. Review of the incident may indicate necessary amendments to existing protocols.

Communication with the community is essential for restoring consumer confidence and Water Services Institution credibility after an incident and/or emergency situation. Notifications advising the end of an incident/emergency and information regarding the cause of the incident and the actions taken to minimise future occurrences are necessary activities for allaying community concerns.

DWS DRINKING WATER QUALITY FAILURE RESPONSE MODEL

In this protocol, drinking water quality failures are defined and classified into Alert Levels based on the magnitude and extent of the failure, as well as the risks to public health posed by the failure. Relevant actions, in compliance with the *SANS 241*, are detailed to rectify the failure and communicate the health risks to the community and relevant authorities.

Definition of a Drinking Water Quality failure

In regulation 5 WSI must compare drinking water quality results with the prescribed National Drinking Water Standards (SANS 241). The ideal situation is where drinking water quality satisfies the SANS 241 limits, suitable for lifetime consumptions. Where water fails SANS 241 limits, efforts are required to ensure that water quality is improved. Importantly, when a health-related water quality determinand does not comply with SANS 241 limits, this is regarded as a failure and would pose a threat to consumers.

Clear Maximum Allowable limits are provided in Table 2 of SANS 241 (Part 1) for microbiological, physical, aesthetic and chemical determinands.

Microbiological determinands can cause the water to fail the Drinking Water specification if they exceed the allowable compliance contribution specified in Table 1 of SANS 241. Furthermore, where a single microbiological test result exceeds the value given in SANS 241 column 4 of Table 1 (for example, *E. coli* > 1 count per 100 mL, or total coliform> 10 counts per 100 mL), and is confirmed as such by a further test, this is regarded as a drinking water quality failure and the required remedial actions and drinking water quality failure response shall follow.

Drinking Water Quality Failure Response

Drinking water quality failures can be considered acute or chronic, depending on associated risks and/or concentrations of the determinands, and therefore require different management approaches. Acute water quality failures are of a short duration, can do harm even with short exposure, and usually result from treatment process inefficiency, water works breakdown or outbreak of bacteriological and protozoan parasite contamination. Acute failures require immediate intervention and if properly managed, can avoid a significant threat to consumers. Examples of acute failures are outbreaks of *Cryptosporidium* and *Giardia*, and equipment breakdown resulting in overdosing treatment chemicals.

INCIDENT MANAGEMENT PROTOCOL FOR DRINKING WATER QUALITY FAILURES

DWS have designated three Alert Levels (See figure 1a and b) to respond to acute drinking water quality failures:

- **Alert Level I (Drinking Water Incident - no significant risk to health): Routine problems including minor disruptions to the water system and single sample non-compliances.**
- **Alert Level II (Drinking Water Failure - potential minor risk to health): Minor emergencies, requiring additional sampling, process optimisation and reporting/communication of the problem.**
- **Alert Level III (Drinking Water Emergency - potential major risk to health): Major emergencies requiring significant interventions to minimise public health risk (Engagement of a designated Emergency Management Team).**

Chronic drinking water quality failures have cumulative effects and usually cause harm due to prolonged low-level exposure to a certain Determinand. Chronic failures are a result of poor source water quality, inadequate treatment processes and poor distribution system infrastructure. Examples of chronic failures are continuous low-level failure of microbiological determinands, or combined trihalomethane concentrations exceeding limits related to high organic loadings in the raw water source. Chronic water quality failure responses require a more co-operative governance approach, with a range of key stakeholders required for interventions.

Incident Management Protocol for Drinking Water Quality

The Incident Management Protocol for Drinking Water Quality is detailed in Table 1 and focuses primarily on the protection of public health and acute drinking water failures (Table 1a) but also includes incidents with aesthetic impacts (Table 1b).

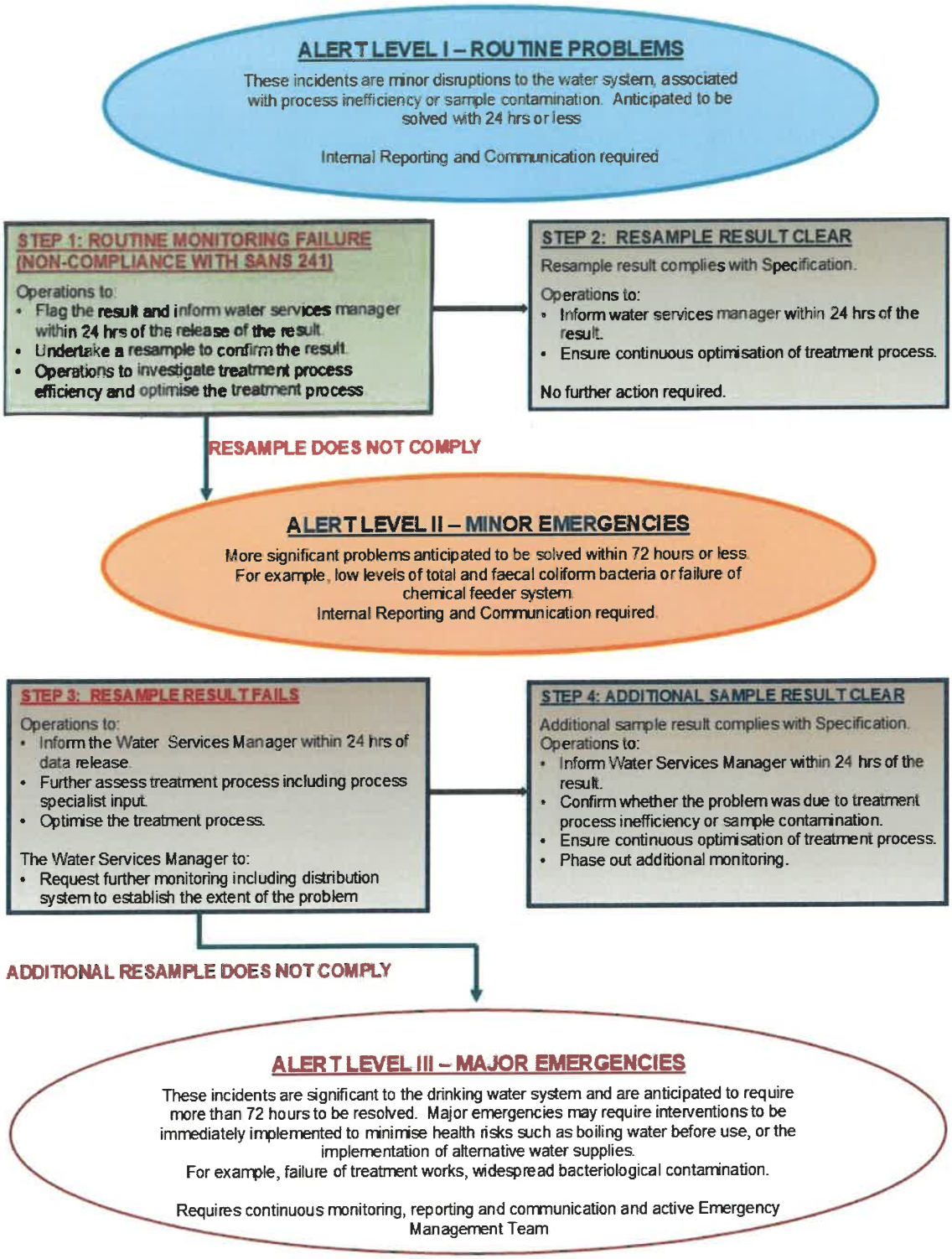
Boil Water Advisories

If the drinking water emergency relates to an *E. coli* failure, a Boil Water Advisory may be required to be issued. Boil water advisories are most frequently based on unacceptable bacteriological quality. This may be because of a significant deterioration in source water quality, equipment malfunction during treatment or distribution or inadequate disinfection or disinfectant residuals. A boil water advisory may also follow the occurrence of an outbreak of illness in the community that has been linked to consumption of the water.

During a boil water advisory, it is essential that all water destined for drinking, preparing infant formulas, juices and ice cubes, washing fruits and vegetables, cooking or dental hygiene be boiled. Consumers need to be informed to hold water at a rolling boil for one minute to inactivate all waterborne pathogenic micro-organisms.

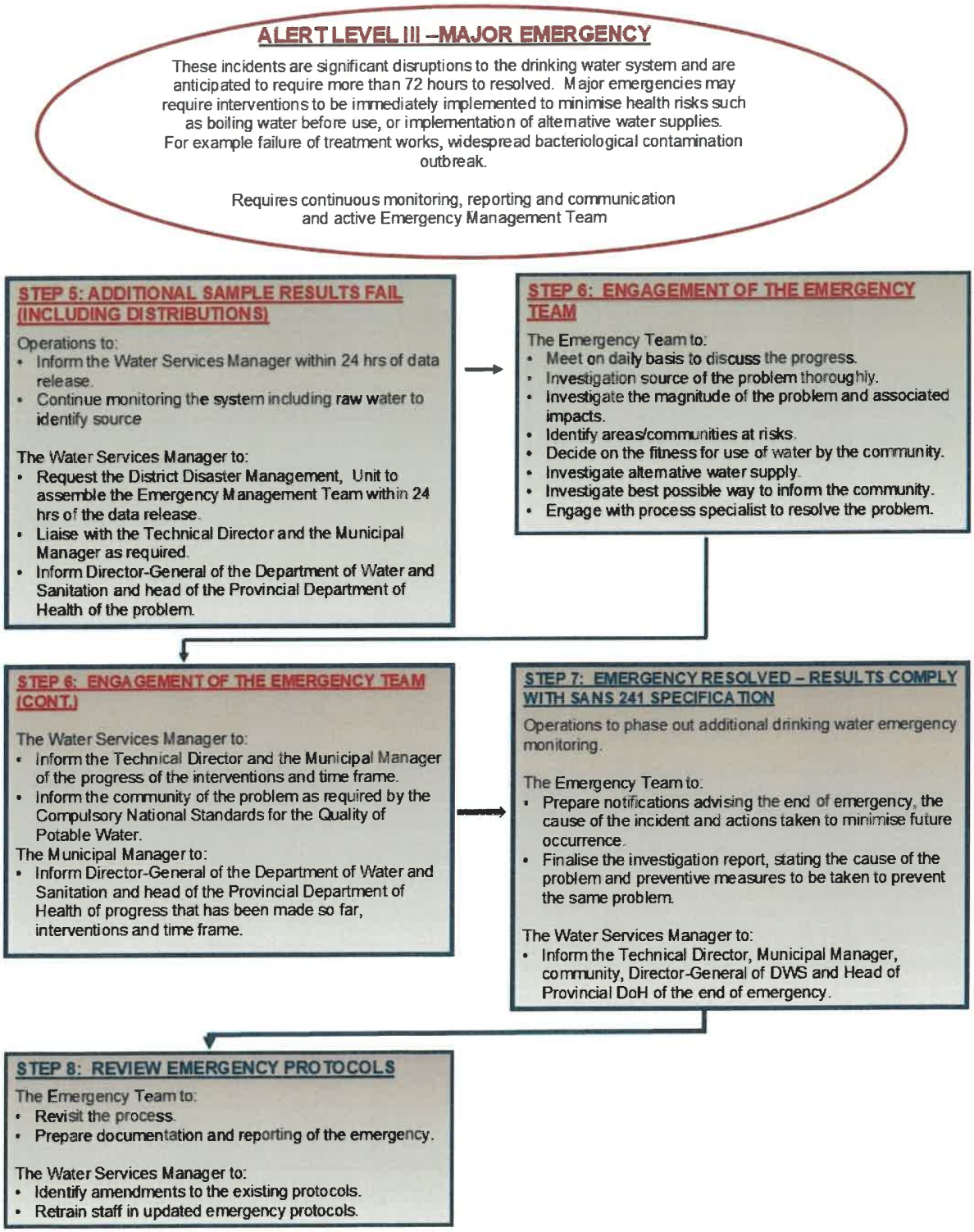
INCIDENT MANAGEMENT PROTOCOL FOR DRINKING WATER QUALITY FAILURES

FIGURE 1a: Acute Drinking Water Quality Failure Model – Response actions



INCIDENT MANAGEMENT PROTOCOL FOR DRINKING WATER QUALITY FAILURES

FIGURE 1b: Acute Drinking Water Quality Failure Model – Response actions(continued)



INCIDENT MANAGEMENT PROTOCOL FOR DRINKING WATER QUALITY FAILURES

The Boil Water Advisory may be withdrawn when:

- the treatment, distribution or operational failure has been corrected, and the contaminated water has been flushed from the distribution system.
- the microbiological quality and disinfectant residual of the treated water in at least two consecutive sets of samples has returned to an acceptable level (zero *E. coli* per 100 mL and adequate disinfectant in the distribution system).

Emergency Management Team

As part of emergency preparedness planning, key role-players in the water sector should be identified and form an Emergency Management team. The Emergency Management team will ensure better management of the emergency situation by involving a number of role players with different expertise to manage the situation. The team plans for coordination of activities, specific roles for stakeholders and reporting protocol, it also manages internal and external communications and information. Depending on the scale of the drinking water quality failure, the District or Provincial Disaster Management Unit may be required to coordinate and manage the compilation of the Emergency Management Team.

The Emergency Management Team should include a range of key stakeholders involved in a drinking water failure crisis, including:

- District or Provincial Disaster Management Unit.
- WSA Water Services Manager.
- WSA Water Works Operations.
- WSA Consumer Services Unit.
- Provincial Department of Local Government.
- DWS Regional Office.
- Department of Health and the District Municipality Environmental Health Practitioners.
- Relevant Non-Governmental Organisations and Community-Based Organisations.
- Community leaders, and
- Other experts in public health or water treatment, as required.

The Emergency Management team members' database with the names and contact details of the members should be readily available and the relevant Water Services Institution must ensure that the database is updated regularly (for example 6-monthly) to ensure that it is accurate.

INCIDENT MANAGEMENT PROTOCOL FOR DRINKING WATER QUALITY FAILURES

Table 1a: Incident Management Protocol for Health-related Drinking Water Quality Incidents

Water quality Determinand Determinant and concentration	Health Implication / Risk	Incident Management Reporting	Required response time	Action
Alert Level I (Drinking Water Quality Incident)				
• 1 *E. coli* per 100mL • 1 Somatic coliphage per 10mL • Any health-related Physical or Chemical result that exceeds the upper limit of SANS 241 Drinking Water limit	• Insignificant chance of infection. • Very slight risk of viral infection with continuous exposure. • Insignificant risk to health – suitable for lifetime consumption.	Internal reporting and communication needed to WSA Manager	Within 24 hrs. of result release	• Communicate out-of-range result(s) to relevant Municipal staff. • Assess associated information and implement corrective action to rectify the incident or resample to confirm result if required. • If resample result confirms the initial result, • implement corrective action to rectify the incident. If resample result exceeds the concentrations specified in Alert Level I, proceed to Alert Level II.
Alert Level II (Drinking Water Quality Failure)				
• 2-10 *E. coli* per 100mL • 2–10 Somatic coliphages per 10 mL • 1 *Cryptosporidium / Giardia*/10L • Turbidity result > 1 NTU • Fluoride results 1.5–1.7 mg/L	• Clinical infections are unlikely in healthy adults but may occur in sensitive groups. • Low risk of viral infection with continuous exposure. • Low risk of protozoan parasite infection. • Indirect associated impacts on health through the shielding of bacteria from disinfection. • Slight mottling of dental enamel.	Internal and External	Same day as result release	• Request additional monitoring as required (both spatially and increased frequency) to establish the source of the contamination and the risk to public health. • Assess treatment process efficiency and implement corrective action to optimise the treatment process. • Communicate the drinking water failure and health risk to the relevant Municipal staff, DWS and Provincial Department of Health. If any additional sample results exceed concentrations specified in Alert Level II, proceed to Alert Level III.

INCIDENT MANAGEMENT PROTOCOL FOR DRINKING WATER QUALITY FAILURES

Water quality Determinand Determinant and concentration	Health Implication / Risk	Incident Management Reporting	Required response time	Action
Alert Level III (Drinking Water Quality Emergency)				
• >10 *E. coli* per 100mL • >10 Somatic coliphages per 10 mL • >1 *Cryptosporidium / Giardia*/10L • Fluoride result >1.7 mg/L • Any health-related Physical or Chemical result that exceeds the upper limit of SANS 241: Drinking Water limit (with exception of turbidity)	• Clinical infections are common, even with once-off consumption. • Significant and increasing risk of infectious disease transmission. • Significant risk of protozoan parasite infection. • Significant risk to human health – exceedance of maximum allowable limits. • Severe tooth damage and skeletal fluorosis with long-term exposure	Internal and External	Immediate	• Engage Emergency Management Team. • Communicate drinking water emergency and health risk to relevant Municipal staff, DG of DWS, Head of Provincial Department of Health. • Continue additional monitoring and extend to the distribution system and point-of-use to establish the source and extent of the incident and the risk to public health. • Assess the communities at risk and the need for an alternate water supply. • Communicate drinking water emergency to community. • Implement specialist process assessment and optimisation of the Drinking Water Supply System from catchment to consumer. • Phase out additional monitoring once the source of the incident has been identified and rectified and two consecutive results have been within specification. • Prepare notifications advising of the end of the emergency. • Assess required preventative action to reduce the likelihood of the incident recurring. • Prepare a report to document and close the incident. • Review and update Incident Management Protocol. • Retrain staff on revised Incident Management Protocol.

Table 1b: Incident Management Protocol for Aesthetic Drinking Water Quality Incidents

INCIDENT MANAGEMENT PROTOCOL FOR DRINKING WATER QUALITY FAILURES

Water quality Determinand Determinant and concentration	Health Implication / Risk	Incident Management Reporting	Required response time	Action
Alert Level I (Drinking Water Quality Incident)				
• Geosmin or 2-MIB 11 - 20 ng/L • Iron 0.4 - 1.0 mg/L • Manganese 0.1-0.2 mg/L	• Moderate unpleasant tastes/odors. • Slight taste and color, slight staining of white clothes • Slight taste and color, moderate staining of clothes and fixtures	Internal	Within 24hrs. of result release	• Communicate out-of-range result(s) to relevant Municipal staff. • Assess associated information and implement corrective action to rectify the incident or resample to confirm result if required. • If a resample result confirms the initial result, implement corrective action to rectify the incident. If resample result(s) exceeds the concentrations specified in Alert Level I, proceed to Alert Level II.
Alert Level II (Drinking Water Quality Failure)				
• Geosmin or 2-MIB >20 ng/L • Iron 1.1-2.0 mg/L • Manganese 0.2 -0.4 mg/L	• Moderate unpleasant tastes/odors • Moderate taste and color, moderate staining of white clothes • Moderate taste and color, increasing staining of clothes and fixtures	Internal and External	Same day as result release	• Request additional monitoring as required (both spatially and increased frequency) to establish the source of the contamination and the aesthetic impact. • Assess treatment process efficiency and implement corrective action to optimise the treatment process. • Communicate the drinking water failure and aesthetic impact to the relevant Municipal staff. If any additional sample results exceed concentrations specified in Alert Level II, proceed to Alert Level III.

INCIDENT MANAGEMENT PROTOCOL FOR DRINKING WATER QUALITY FAILURES

Water quality Determinand Determinant and concentration	Health Implication / Risk	Incident Management Reporting	Required response time	Action
Alert Level III (Drinking Water Quality Emergency)				
• Iron >2 mg/L • Manganese >0.4 mg/L	• Objectionable and increasing unpleasant tastes/odors • Objectionable taste and appearance, staining of clothes • Off-putting taste and appearance, severe staining of clothes and fixtures	Internal and External	Immediate	• Continue additional monitoring and extend to the distribution system and point-of-use to establish the source and extent of the incident and the aesthetic impact. • Communicate aesthetic drinking water emergency to community. • Implement specialist process assessment and optimisation of the Drinking Water Supply System from catchment to consumer. • Phase out additional monitoring once the source of the incident has been identified and rectified and two consecutive results have been within specification. • Prepare notifications advising of the end of the aesthetic drinking water emergency. • Assess required preventative action to reduce the likelihood of the incident recurring. • Prepare a report to document and close the incident. • Review and update Incident Management Protocol. • Retrain staff on revised Incident Management Protocol.

ANNEXURE B: Referenced Documents

Electronic copies of the following referenced documents can be found and downloaded from https://ws.dws.gov.za/iris/documents.aspx or on links where provided below:

A Drinking Water Quality Framework for South Africa, Department of Water and Sanitation, December 2005.

A Protocol to manage the potential of groundwater contamination from on-site sanitation Practices, March 2003.

Guidance on drinking water treatment process audits and plant optimisation, WRC Report No TT755/18, August 2018.

Guidelines for Greywater use and management in South Africa, Water Research Commission Report no TT746/17, March 2018.

Guideline for human settlement planning and design (the Red Book), Department of Housing and CSIR, BOUTEK Report no BOU/E2001.

Guidelines for the Utilisation and Disposal of Wastewater Sludge:
Volume 1 of 5 Impact assessment, Water Research Commission Report TT 39/09, 2009.
Volume 2 of 5 Requirements for the agricultural use of wastewater sludge, Water Research Commission Report no TT 262,06
Volume 3 of 5 Requirements for the on-site and off-site disposal of sludge Water Research Commission Report TT 39/09, 2009.
Volume 4 of 5 Requirements for the beneficial use of sludge at high loading rates, Water Research Commission Report TT 350/09, 2009.
Volume 5 of 5 Requirements for thermal sludge management practices and for commercial products containing sludge, Water Research Commission Report TT 351/09, 2009.

Guideline for the preparation of an IWA water balance to determine Non-Revenue water and water losses (Department of Water and Sanitation, 2014).

Guidelines on Sanitation and Health (2018) World Health Organization.

Integrated Water Sector Skills Intervention Map Based on a Sector Skills Gap Analysis, Water Research Commission Report 2113/1/14, March 2015.

Maintenance management standard for immovable assets www.publicworks.gov.za May 2017.

Part 3 (Emergency Housing Programme) of the National Housing Code, Volume 4 (Department of Human settlement (2009).

Regulations for Hazardous Biological Agents, 2022 Government Notice R1887 of 2022.

Regulations relating to compulsory national standards for process controller and water services works, Government Notice Regulation 3630, June 2023.

Referenced Documents:

Regulation R634 National Environmental Management: Waste Act: Waste Classification and Management Regulations (23 August 2013, Gazette 36784)

Regulation R635 National Environmental Management: Waste Act: Waste National Norms and Standards for the assessment of waste for landfill disposal (23 August 2013, Gazette 36784)

Regulation R636 National Environmental Management: Waste Act: Waste National Norms and Standards for disposal of waste to landfill (23 August 2013, Gazette 36784)

Regulation R715 National Environmental Management: Waste Act: Exclusion of a waste stream of a portion of a waste stream from the definition of waste (18 July 2018, Gazette 41777)

Sanitation Safety Planning Manual (2022) World Health Organization.

Standard Operating Procedures for Groundwater Source Development for Community Water Supply Projects" 2023.

Wastewater Risk Abatement Plan, A W_2RAP guideline, Water Research Commission Report TT 489/11, June 2011.

Water And Sanitation Services on Privately Owned Land Policy 2023.

Water borne sanitation operations and maintenance guide, Water Research Commission Report TT 482/11, March 2011.

Water Services Infrastructure Asset Management Strategy (Department of Water and Sanitation 2011).