

Johannesburg, South Africa

## Dolomite Risk Management

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# Johannesburg South Africa

## Dolomite Risk Management By-law, 2022

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**Commenced on 3 June 2022**

*[This is the version of this document from 3 June 2022 and includes any amendments published up to 4 April 2024.]*

The City Manager hereby, in terms of the provisions of Section 13 of the Local Government Municipal Systems Act, 2000 ([Act 32 of 2000](#)) publishes the by-laws passed by the City of Johannesburg Metropolitan Municipality in accordance with Section 12 of the aforementioned Act to provide for:

- an integrated, standardised approach to spatial planning and land use management by the City of Johannesburg Metropolitan Municipality on dolomite land;
- an integrated Dolomite Risk Management System to reduce the likelihood of sinkholes and subsidences occurring;
- establishing a tolerable hazard rating on dolomite land in the Municipality and
- empowering officials in the City of Johannesburg Metropolitan Municipality to effectively assert law enforcement to ensure safe, sustainable development on dolomite land.

### 1. Definitions

**"Development services certificate on dolomite land"** is a certificate confirming that the design and layout of services on a site on dolomite land complies with the minimum standards selected by the City of Johannesburg Metropolitan Municipality from time to time and the requirements of any relevant Act, Regulation or Regulatory Authority.

**"Cessation Notice"** means written notification by the City of Johannesburg Metropolitan Municipality instructing the halting of construction or other activities on dolomite land due to non-compliance with the minimum standards and procedures set down by the Dolomite Risk Management Section

**"Competent Person (dolomite)"** refers to a practitioner of engineering geology or geotechnical engineering who is registered in the appropriate category of registration provided for in the relevant national legislation.

**"Competent Person (civils)"** refers to a practitioner of civil engineering who is registered in the appropriate category of registration provided for in the relevant national legislation.

**"Developer"** shall mean any public entity, including organs of state at national, provincial or local level of government, individual, company, body corporate, partnership, closed corporation or any other association of persons.

**"Development"** shall mean any proposed or existing, permanent or temporary, formal or informal structure or structures for residential occupation, storage, business, manufacturing, agriculture, recreation, burials, worshipping, medical care, entertainment, education, or for whatever purpose, including infrastructure, roads, bridges, subsurface or surface pipelines, subsurface or surface telecommunications infrastructure, storm water systems, electrical generation and reticulation networks, railway infrastructure and networks, water care works, water retaining structures, water attenuation structures and related infrastructure, additions to structures, land use rezoning and land sub-division.

**"Dolomite Clearance Certificate"** refers to a City of Johannesburg Metropolitan Municipality letter confirming that:

- the Site Development Plan (where required) or the Building plan for a development has been certified by the Competent Person (Dolomite) and the Competent Person (Civils) Civils and

- the development is supported based on the above certifications.

**"Dolomite land"** refers to land underlain by dolomite bedrock or residuum typically at depths of no more than:

- a) 60m in areas where no dewatering has taken place and the local authority that has jurisdiction, is monitoring and has control over the groundwater levels in the areas under consideration; or
- b) 100m in areas where dewatering has taken place or where the local authority has no jurisdiction or control over groundwater levels

**"Dolomite risk management notice"** is a written dolomite risk management related instruction issued to any land owner, developer or servitude holder in terms of the provisions of this by-law.

**"Dolomite hazard certification"** is a statement contained on the Township Layout Plan, Site Development Plan (where applicable in terms of a town planning scheme) and Building Plan confirming that the dolomite hazard zonation and development layout as reflected on the plan, conforms to the contents of the dolomite stability report.

**"Dolomite Risk Management Strategy (DRMS)"** refers to the process of utilizing scientific, planning, engineering and social processes, procedures and measures to manage an environmental hazard, and encompasses policies, and procedures set in place to reduce the likelihood of sinkholes and subsidences occurring on dolomite land.

**"Sinkhole"** refers to a feature that occurs suddenly and manifests as a hole in the ground.

**"Spatial development framework"** means the spatial development framework referred to in Section 26(e) of the Local Government: Municipal Systems Act 2000 and the Spatial Planning Land Use Management Act, [Act 16 of 2013](#);

**"Subsidence"** refers to a shallow, enclosed depression in the ground.

**"Tolerable hazard rating"** is where the number of sinkhole and subsidence events experienced is less than and including 0.1 events per hectare per 20 years (preferably tending to 0 per hectare), that is, exceeding a Return Period of 200 years and intolerable where the number of events experienced exceeds 0.1 events per hectare per 20 years (Return Period less than 200 years).

**"Town planning scheme"** means a town planning scheme, zoning scheme or similar instrument statutorily regulating land use.

## 2. Applications

- (1) This by-law applies to all areas within the City of Johannesburg Metropolitan Municipality jurisdiction that are underlain by dolomite land and prevails over any other by-law which regulates or otherwise deals with spatial development, township establishment and dolomite risk management.
- (2) The City Manager of the City of Johannesburg Metropolitan Municipality or his/her delegated nominee shall be responsible and accountable for the enforcement of this by-law in the City of Johannesburg Metropolitan Municipality area of jurisdiction.

## Part 1 – Directives

### 3. Directive principles

- (1) That Spatial planning, land use management and land development must be sustainable and safe in those areas of the City of Johannesburg Metropolitan Municipality defined as dolomite land.
- (2) That dolomite risk management is applied to dolomite land in the City of Johannesburg Metropolitan Municipality to achieve a tolerable hazard rating.

## Part 2 – Spatial planning

### 4. Spatial planning framework

- (1) The spatial development framework that must be included into all municipal integrated development plans on dolomite land in the City of Johannesburg Metropolitan Municipality in terms of Section 26(e) of the Local Government, Municipal Systems Act 2000 ([Act 32 of 2000](#)) and the Spatial Planning Land Use Management [Act 16 of 2013](#) must be consistent with and must give effect to the principles contained in the Dolomite Risk Management Strategy of the City of Johannesburg Metropolitan Municipality.
- (2) All land development applications submitted in terms of any of the land control legislation, shall be consistent with and give effect to the principles contained in the Dolomite Risk Management Strategy of the City of Johannesburg Metropolitan Municipality.

## Part 3 – Requirements

### 5. Dolomite risk management section

- (1) The City of Johannesburg Metropolitan Municipality shall establish and maintain a Dolomite Risk Management Section within the Municipality to mitigate the risks associated with development on dolomite land.
- (2) The Dolomite Risk Management Section shall appoint a permanent dolomite risk manager.
- (3) The Dolomite Risk Management Section shall develop and administer the Dolomite Risk Management Strategy on dolomite land in the City of Johannesburg Metropolitan Municipality.

### 6. Dolomite risk management standards and specifications

- (1) The Dolomite Risk Management Section shall from time to time recommend to Council amendments to the Dolomite Risk Management Policy on review/determination of standards and specifications that are deemed appropriate with regard to:
  - a. the placing of restrictions on land use and development densities;
  - b. the establishing of the requirements for the management of surface drainage;
  - c. the establishing of requirements for the management and monitoring of groundwater levels;
  - d. the establishment of requirements for improving the effectiveness of the design and construction of buildings, structures and services to mitigate risk;
  - e. the establishing of requirements for the maintenance of water bearing structures and services and measures to mitigate risk;
  - f. the identification of all the dolomite related hazards that are to be managed for the life time of a development and
  - g. establishing suitable risk management controls, processes, procedures and measures to manage the identified hazards and risks.

In addition, the requirements of any relevant Act, Regulation or Regulatory Authority shall apply.

## **7. Elements of the dolomite risk management system**

- (1) The Dolomite Risk Management Section shall establish and maintain a dolomite risk management data base, containing such information that is relevant to the day to day management of the dolomite risk, including the following:
  - a. Topocadastral information;
  - b. Geological data showing distribution of dolomite within the City of Johannesburg Metropolitan Municipality;
  - c. Relevant geophysical survey data;
  - d. Geohydrological data including groundwater compartments and original groundwater levels, groundwater monitoring boreholes and measured levels;
  - e. Sinkhole and subsidence data;
  - f. Inherent hazard zonation of the dolomite land on a regional, strategic level;
  - g. Monitoring areas.
  - h. Upgrading of infrastructure according to standards selected by the City of Johannesburg Metropolitan Municipality from time to time and the requirements of any relevant Act, Regulation or Regulatory Authority.

## **8. Requirements for registered land owners, recognized mandated land management bodies or their nominees**

- (1) Registered land owners, recognized mandated land management bodies or their nominees shall be responsible for implementing and undertaking dolomite risk management in their area of ownership or responsibility.

## **9. Emergency reaction to sinkhole and subsidence formation**

- (1) The City of Johannesburg Metropolitan Municipality shall identify, notify and train persons to respond to emergency situations as a result of dolomite hazards.
- (2) Registered land owners, recognized mandated land management bodies/entities or their nominees as is relevant, shall, in the event of severe cracking, sinkhole or subsidence formation, report such an occurrence and remedial measures to be taken to the Dolomite Risk Management Section of the City of Johannesburg Metropolitan Municipality within 24 hours of the event occurring.
- (3) A Competent Person (dolomite) shall be appointed to investigate the occurrence of any sinkhole or subsidence.
- (4) The detailed investigation and rehabilitation shall take place within 30 days of the event occurring unless the Competent Person (dolomite) permits an extension of time.
- (5) The Competent Person (dolomite) shall recommend the method, by which the sinkhole or subsidence shall be rehabilitated, ensure that the rehabilitation intent is satisfied and monitor the rehabilitated sinkhole or subsidence for a period of time.
- (6) The Competent Person (dolomite) shall submit a Completion Report to the City of Johannesburg Metropolitan Municipality within 21 days of completion of the rehabilitation of a sinkhole or subsidence. This report shall document the nature of the event, its cause and remedial measures and rehabilitation undertaken.
- (7) The rehabilitation of sinkholes and subsidences shall be in accordance with standards selected by the Dolomite Risk Management Section of the City of Johannesburg Metropolitan Municipality from time-to-time.

- (8) If an event occurs on private property, caused by a leaking, private service and is deemed to potentially compromise the safety of third parties, the Dolomite Risk Management Section may recommend that the Disaster Management Department of the City of Johannesburg Metropolitan Municipality take appropriate action in terms of the Disaster Management Act ([Act 57 of 2002](#)) to preclude a disaster occurring.
- (9) The Dolomite Risk Management Section of the City of Johannesburg Metropolitan Municipality shall have the authority to serve notice on registered land owners, recognized mandated land management bodies/entities, servitude holders or utilities, or their nominees, as is relevant, that a potentially hazardous situation shall be remedied at their own expense within a reasonable period of time determined by safety considerations.

## 10. Dolomite Risk Management Plan for proposed developments

- (1) A Competent Person (dolomite) shall compile a provisional Dolomite Risk Management Plan for a proposed development on dolomite land. The developer shall submit the plan to the Dolomite Risk Management Section of the City of Johannesburg Metropolitan Municipality. Such a Plan shall address at least the following as is relevant:
  - a. Hazard zonation and permissible land uses in accordance with current practice;
  - b. Any restrictions to be placed on developments for reasons of dolomite risk management;
  - c. The provision of infrastructure in relation to the hazard zonation, and design provision thereof;
  - d. All precautionary measures required to support development for designated and potential future land uses;
  - e. Storm water management requirements taking account of;
    - i. Topography;
    - ii. Location of storm water pipes and canals;
    - iii. Points of discharge onto adjoining properties;
    - iv. Areas of anticipated poor drainage;
    - v. Points of discharge into local storm water systems;
    - vi. Design specifications;
    - vii. Priority maintenance areas;
  - f. The delineation of areas of restricted movement;
  - g. Identification of monitoring designations in relation to the hazard zonation;
  - h. Groundwater level monitoring requirements;

## 11. Hazard assessment of sites for development

- (1) All sites proposed for development on dolomite land in the City of Johannesburg Metropolitan Municipality shall be hazard zoned according to current practice and in accordance with standards, guidelines and specifications acceptable to the Dolomite Risk Management Section of the City of Johannesburg Metropolitan Municipality.
- (2) Planning of all sites located on dolomite land in the City of Johannesburg Metropolitan Municipality shall be appropriate in relation to the hazard zonation and in accordance with the standards and specifications in terms of the approved Dolomite Risk Management Policy and the requirements of any relevant Act, Regulation or Regulatory Authority.

- (3) Dolomite stability reports for developments in the City of Johannesburg Metropolitan Municipality shall be submitted to the Dolomite Risk Management Section for record purposes.
- (4) Existing developments on dolomite land shall be hazard zoned as and when practically feasible for inclusion in the Dolomite Risk Management System of the City of Johannesburg Metropolitan Municipality.

## 12. Certification

- (1) The following certification is required for new developments situated on dolomite land within the City of Johannesburg Metropolitan Municipality:
  - a. The Competent Person (dolomite) appointed by the developer of a site located on dolomite land shall confirm in writing, on the Site Development Plan (where applicable) and the Building Plan, that the hazard zonation and the layout of the development is in accordance with the findings contained in the dolomite stability report.
  - b. The Competent Person (civils) appointed by the developer shall provide and sign the Development Services Certificate for a particular development confirming compliance with the standards selected by the local authority from time to time. Where deviations from these standards are necessary, these are to be motivated to the satisfaction of the City of Johannesburg Metropolitan Municipality.
- (2) The head of the Dolomite Risk Management Section or a delegated official shall be responsible for verifying that the following signed certification has been received prior to granting permission for development on dolomite land:
  - a. Dolomite hazard certification on the Site Development Plan (where applicable) and the Building Plan by the Competent Person (dolomite).
  - b. The Development Services Certificate for the particular development signed by the Competent Person (civils).

## 13. Groundwater level monitoring

- (1) The Dolomite Risk Management Section of the City of Johannesburg Metropolitan Municipality shall establish and maintain a groundwater level monitoring and control system in the dolomite aquifers within its area of jurisdiction.
- (2) A network of groundwater level monitoring boreholes shall be established to ensure adequate coverage of the dolomite aquifers in the City of Johannesburg Metropolitan Municipality.
- (3) The Competent Person (dolomite) undertaking the hazard assessment of a site on behalf of a developer shall indicate the need for groundwater level monitoring on a site.
- (4) Where necessary, and if required for pre-proclamation approval, the developer of a site shall be required to drill and install a groundwater level monitoring borehole, or boreholes, in accordance with the specifications of the Dolomite Risk Management Section, within a servitude in favour of the City of Johannesburg Metropolitan Municipality.
- (5) The Dolomite Risk Management Section shall at regular, appropriate scientifically determined intervals measure the groundwater levels.
- (6) Groundwater monitoring boreholes shall be maintained in an operational condition. Where a monitoring borehole (well) is located on private property, other than that owned or controlled by the City of Johannesburg Metropolitan Municipality, it may instruct the owner of the property to repair the well to an operational condition, if the owner or a contracting party was responsible for the damage. Failing to do so may result in the issuing of a penalty as provided for in [Section 20](#) of this bylaw.



- (7) The groundwater compartments and original groundwater levels shall be determined for each groundwater compartment in the City of Johannesburg Metropolitan Municipality. Groundwater levels are to be monitored and controlled to ensure that these identified levels are maintained.
- (8) If groundwater level draw down is identified within the Municipal Boundary the source of abstraction shall be determined. The party or parties abstracting groundwater shall be informed and instructed to reduce abstraction or terminate abstraction as is appropriate.
- (9) No boreholes for the abstraction of groundwater are permitted on dolomite land in the City of Johannesburg Metropolitan Municipality without the written consent of the Dolomite Risk Management Section.
- (10) Existing boreholes for the abstraction of groundwater on dolomite land in the City of Johannesburg Metropolitan Municipality shall be registered with the Dolomite Risk Management Section within 12 (twelve) months of promulgation of these by laws. And where required such abstraction license can be revoked in the interest of safety concerns.
- (11) Where the Competent Person (Dolomite) designates that groundwater monitoring and control is required in a development, a letter of commitment consisting of two parts is to be issued by the City of Johannesburg Metropolitan Municipality, namely:
  - a. Part A in which the Competent Person (Dolomite) is to confirm the hazard classification of the site, the current groundwater level on the site and the need for groundwater level monitoring and control.
  - b. Part B is to confirm that the City of Johannesburg Metropolitan Municipality will undertake groundwater level monitoring and control in the area of the development.

#### **14. Infrastructure design, maintenance and repair**

- (1) The design, maintenance and repair of infrastructure and services on dolomite land shall be in accordance with the requirements and standards as set out in the approved Dolomite Risk Management Policy.

#### **15. Evacuation of unsafe hazardous areas**

- (1) The City of Johannesburg Metropolitan Municipality shall, as required, evacuate areas deemed to be unsafe in the event of the pending occurrence or occurrence of a sinkhole or subsidence.
- (2) The City of Johannesburg Metropolitan Municipality is authorized to enter private property to investigate potentially hazardous conditions that are considered to be life threatening beyond the boundaries of the property.
- (3) The City of Johannesburg Metropolitan Municipality is authorized to terminate water bearing services on private property for a necessary period of time to preclude the occurrence of a pending sinkhole or subsidence which may endanger the public.
- (4) Where an event occurs on private land and is deemed as a serious threat to the safety of third parties, the Dolomite Risk Management Section shall notify the Disaster Management Department of the City of Johannesburg Metropolitan Municipality to have an identified area declared unsafe and institute immediate appropriate remedial actions or measures.

#### **16. Review of Dolomite Risk Management Strategy**

- (1) The City of Johannesburg Metropolitan Municipality shall ensure that a review of the Dolomite Risk Management Strategy is carried out every 5 (five) years by an independent Competent Person (dolomite).
- (2) The City of Johannesburg Metropolitan Municipality shall retain records of the reviews undertaken.

## **17. Alienation and leasing of property and granting of servitudes on City of Johannesburg Metropolitan Municipality land**

The City of Johannesburg Metropolitan Municipality shall establish and maintain dolomite risk management policies with respect to the alienation or leasing of its properties situated on dolomite land and the granting of servitudes on such land.

### **Part 4 – Prohibitions**

## **18. Non-compliance**

- (1) No Building Plan on dolomite land shall be approved without a Dolomite Clearance Certificate.
- (2) No developer may attempt to submit or to obtain approval of a Site Development Plan (where applicable) or Building Plan on dolomite land without a Dolomite Clearance Certificate.
- (3) No municipal policy or by-law relating to development on dolomite land in the City of Johannesburg Metropolitan Municipality may supersede or purport to supersede the requirements of this by-law.

### **Part 5 – Transgression**

## **19. Termination of development**

- (1) The Head of the Dolomite Risk Management Section may at any point in time issue to and serve on, any developer not complying with the requirements of this by-law, a cessation notice requiring immediate cessation of the development process or construction, until full compliance is achieved with the requirements of this by-law.
- (2) The Head of the Dolomite Risk Management Section, depending on the hazard class or classes of the land on which non-compliant development has commenced or taken place, may proceed with legal steps through the City of Johannesburg Metropolitan Municipality's legal representative to obtain a court order for the demolition of all improvements on such land at the cost of the developer.

## **20. Penalties**

- (1) Any land owner, developer, servitude holder or their nominee failing to comply with the requirements of a dolomite risk management notice issued by the Dolomite Risk Management Section of the City of Johannesburg Metropolitan Municipality shall be guilty of an offence and liable on conviction, except where otherwise expressly stated, to:
  - a. A fine not exceeding R 10 000,00 or in default of payment to imprisonment for a period not exceeding six months or to both such fine and imprisonment;
  - b. In case of successive or continuous breaches of this By-law it is provided that any expense incurred by the Municipality in consequence of such stipulation in this By-law or in the execution of any work directed by this By-law to be executed and not executed shall be paid by the person committing such breach or failing to execute such work. The municipality may institute a claim in the appropriate court for the amount of such cost and/or damages.
- (2) Any developer/land owner/servitude holder or their nominee not complying with the terms and conditions of this By-law shall be guilty of an offence and legal action shall be taken against such land owner/developer/servitude holder or their nominee for the appropriate legal remedy.