

MASTER PLAN OF
SOFIA MUNICIPALITY



GEOLOGY AND MINERAL WATERS

WATERBEARING ZONES AND DEPOSITS OF
THERMINERAL WATERS (HYDROTHERMY)
ON THE TERRITORY OF SOFIA MUNICIPALITY

- HYDROTHERMAL ZONES**
- ZONE WITH SPORADIC FIELDS OF LOW-MINERAL ALKALI HYDROTHERMS
 - LINEAR ZONE WITH SPORADIC FIELDS OF THERMAL WATERS OF ALKALI-SOIL TYPE
 - ARTESIAN ZONE WITH THERMINERAL WATERS WITH INCREASED BICARBONATE (SODA) MINERALIZATION
 - ZONE WITH SUBTHERMAL KARST WATERS
 - ARTESIAN ZONE OF MINERAL WATERS WITH EXOTIC SODA – GLAUBER COMPOSITION
 - ZONE OF HIGH TEMPERATURE WATERS IN KAZICHENE
 - PERIPHERY LAYER-ARTESIAN ZONE OF THERMAL WATERS
 - FRAGMENT OF THE FAULT – FISSURE WATER-BEARING SYSTEM IN THE GRANO-DIORITE MASSIVE OF PLANA MOUNTAIN
 - MOUNTAIN MASSIVES
- ★ Natural sources of mineral waters
● Drilled sources of mineral waters
● More important investigation drillings and drillings under control

I – ZONE WITH SPORADIC FIELDS OF LOW-MINERAL ALKALI HYDROTHERMS IN VOLCANIC AND SEDIMENT ROCKS, AGING FROM THE UPPER CRETACEOUS PERIOD.
FOUND AND UNCOVERED FIELDS: Banyia, Gorna Banyia, Knyazhevo, Sofia – centre, Lozenets, Borisova gradina
POTENTIAL FIELDS: In the range of some residential neighbourhoods (Lyulin, Zapaden park, Pzazadnika, Laguna-Hipodroma, Ivan Vazov, Danabad, Geo Milev – east, Mladost 1, Druzhba)
QUALITY OF THE WATER: low mineralization (0.130-0.300g/l) bicarbonate-sulfate-sodium composition; increased content of silicon (H₂SiO₃); alkali reaction; temperature 25(30)-60(55)°C.

II – ZONE WITH SPORADIC FIELDS OF THERMAL WATERS OF ALKALI-SOIL TYPE IN LINEAR LINE OF DISLOCATED AND KARSTIFIED CONGLOMERATES FORMED OF LIMESTONE AND DOLOMITES WITH A TRIASSIC ERA AGE.
FOUND FIELDS: Ovcha Kupel, Pancharevo
POTENTIAL FIELDS: New fields along the line Suhodol-Ovcha Kupel-Krasno selo-Yuzhen park-Gerena-Mladost 4-Gorbylanye-Pancharevo dam the wall-German
QUALITY OF THE WATER: mineralization 0.4-1 (1.2) g/l, bicarbonate – calcium – magnesium or bicarbonate – sulphate – calcium – sodium composition with a neutral reaction; temperature 25(30)-50(55)°C.

III – WATER BEARING ZONE IN SAND AND MARLS FROM THE UPPER CRETACEOUS PERIOD AND LAYERS OF NEOGENOUS SANDS, GRAVELS AND SAND BETWEEN THEM
FOUND BY DRILLING FIELDS: Kostinbrod (the railway station and the poultry farm), Nadezhda 2 neighbourhood (Lokomotiv stadium and the 15th high school)
POTENTIAL FIELDS: New fields along the line Kostinbrod-Voluyak-Obelya-Mlybitsa-Nadezhda-Haidzhi-Dimitar-Poduyane-Suhata reka-airport Sofia
QUALITY OF THE WATER: increased mineralization 1-2.5 g/l, bicarbonate – sodium (soda) composition; increased content of the sulphide sulphur (H₂S), barium, silicon and other components; temperature between 30(35) up to 65, possibly up to 65 °C.

IV – ZONE WITH SUBTHERMAL KARST WATERS IN NORTH-WESTERN PART OF SOFIA HOLLOW
DRILLING WATER SOURCES: Kostinbrod and surroundings
POTENTIAL SITES FOR DRILLING: Golyanovtsi village, Zhiton village and associated valley of the Blato river
QUALITY OF THE WATERS: low mineralization 0.4-0.6 g/l, bicarbonate calcium-magnesium (alkali) composition; temperature from 20(25) up to 30(35), possibly up to 40 °C.

V – CIRCULATION OF MINERAL WATERS WITH SODA – GLAUBER IN THE TRIAS LIMESTONES, DOLOMITES AND SANDSTONES AND LYING OVER THEM NEOGENOUS SANDS AND GRAVELS IN THE DEEPEST PARTS OF SOFIA TECTONIC DITCH
FOUND BY DRILLING FIELDS (SITES): Dobroslavtsi, Novi Iskar (Kumantitsa), Gniliyane, Mramor, Trebich, Ilyantsi, Chepiritsi and Kivina-Dolni Bogrov
POTENTIAL FIELDS: In the spaces around Mirovyane, Kubratovo, Ilyantsi, Berkovski, Negovan, Vrazhdebna, Chelopechene, Dolni Bogrov and Kivina
QUALITY OF THE WATERS: comparatively high mineralization (2.5-4.5 g/l); soda – glauber (bicarbonate – sulphate – sodium) composition; with high content of free CO₂ along the line Mramor-Trebich-Ilyantsi; temperature: 40-50°C, possibly up to 65-70°C; genetic and chemical similarity with mineral waters in Merchlen and Karlovi vari

VI – EAST SOFIA AND KAZICHENE WATER BEARING SYSTEM – BARELY EXPLORED ZONE OF FORMING, CIRCULATION AND ACCUMULATION OF HIGH TEMPERATURE WATERS DISLOCATED AND CRUSHED BLOCKS OF TRIAS LIMESTONE, DOLOMITES AND SANDSTONES IN SOUTH-EASTERN PART OF SOFIA TECTONIC DITCH
FOUND BY DRILLING HYDRO-THERMAL FIELDS: Kazichene-Ravno pole
POTENTIAL FIELDS: Around Busmanitsi, Iskar station, possibly Verila and in some surroundings of Musachevo, Lozen i Vrazhdebna
QUALITY OF THE WATERS: mineralization 0.8-1 (1.5) g/l, bicarbonate alkali composition; with increased content of silicon and free CO₂; temperatures from 40-50 up to 70-80°C, possibly up to 90 °C
ADDITION: Impressive effect of warming and overheating from 30 to 60°C of waters in non-deep neogene water-bearing layers, occurring over the geometric dome of Kazichene-Ravno pole field

VII – LAYER-ARTESIAN ZONE OF THERMAL WATERS IN DIFFERENT IN SCOPE AND DEPTH LAYERS OF SANDS, SANDSTONES AND GRAVELS IN THE LOWEST LEVELS OF NEOGENE SEDIMENTARY FILLING OF SOFIA TECTONIC DITCH
MORE IMPORTANT DRILLING WATER SOURCES: Svetovrachene, Dolni Gorni Bogrov, Elin Pein
POTENTIAL REGIONS FOR DRILLING AND EXPLOITATION: Around Musachevo, Elin Pein, Dolni Gorni Bogrov, Botunets and the stripe between Negovan, Lokorsko, Podgumer and Svetovrachene
QUALITY OF THE WATERS: Mineralization (0.7-1.5 g/l) bicarbonate-sodium content; content of the sulphide sulphur (H₂S) alkali reaction; temperature 30(35)-50(55)°C
ADDITION: The zone covers partially 5th and 6th water-bearing zones and could be explored and exploited with them

VIII – FRAGMENT OF THE FAULT – FISSURE WATER-BEARING SYSTEM IN THE GRANO-DIORITE MASSIVE AND CONNECTED WITH IT FIELDS OF LOW-MINERAL ALKALI OF HYDROTHERMS IN ZHELEZNITSA, ISKAR DAM AROUND SHARKOLOVO GNEZO AND BELCHINSKI BANI

- NUMBERING OF NATURALLY FOUND AND UNCOVERED THROUGH DRILLING FIELDS OF MINERAL WATERS**
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|-----------------------------------|-----------------------------|
| 1. Banyia | 13. Gorni Bogrov |
| 2. Banyane | 14. Bymitsi |
| 3. Gorna Banyia | 15. Nadezhda neighbourhood |
| 4. Knyazhevo | 16. Ilyantsi |
| 5. Sofia centre + zone B5 | 17. Trebich |
| 6. Lozenets + Republika beach | 18. Mramor |
| 7. Ovcha Kupel | 19. Dobroslavtsi |
| 8. Pancharevo | 20. Novi Iskar (Kumantitsa) |
| 9. Zheleznitza | 21. Gniliyane |
| 10. Iskar dam (Sharkolovo gnezo) | 22. Svetovrachene |
| 11. Kazichene – shallow | 23. Chepiritsi |
| 12. Kazichene – Ravno pole – deep | |

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