solve SNAE. To solve systems of linear algebraic equations (SLAE), which include SODE and SNAE (at each time step and / or at each iteration of nonlinearities), the LU decomposition method is used with the symbolic factorization and also taking into account the matrix sparsity of thermal conductivities.

After the TPM was created, the calculations are carried out.According to the results the user is able to obtain various textual and graphical information. The data is displayed for both stationary calculation in the form of a temperature tables in the model nodes and for the nonstationary calculation in the form of a temperature dependency graph in the model nodes on the time and temperature table in the time intervals in the model nodes.

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THE DRAINAGE LOCAL DRY AREAS WITH GROUND WATERS OVERFLOW IN THE UNDERLYING AQUIFER

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The systems drainage construction method is known, having included the excavation tranches, the pipe – lines and the collector – drainage system laying, the bore pits excavation on the picket well lines, and the wells installation in these wells – water separators, the wells connecting to the collector – drainage network, the filters' implementation around the well, the tranches' and the bore pits' backfilling. At the well – absorbents installing together with the pipe – line laying, between its tee fitting set units, each of which is connected the flexible perforated branch pipe, whose end is brought up to the surface of the soil, the filter column is carried out around it, and the trench is finally covered. Then, on the filter column border the hole is torn, in which the well is set, and, simultaneously, the flexible branch pipe is connected to the well, with the filter creation.

So, the soil draining way with the drainage water reduction is the closest to the technical nature to the proposed technical solution, and, moreover, it has been taken, as the prototype. The shaft wells and the mine shafts construction, the drilling from the bottom of the last opposing horizontal wells, the removal of them. At the same time, during the counter wells drilling, their location end sections at the different levels and the latest equipment by the water intakes are produced, and during the water drainage, the evacuation is carried out counter located below each well, and, at that, the end sections locations are within the limits of their efficient range. Just after the counter wells drilling, the counter – tunneling is carried out over them the additional drainage wells.

The known technical solution drawback is, that the receiving wells are in the same aquifer of the ground (e.g. subsoil and subsurface ones) waters, having based on the impervious layer (e.g. aquiclude).

The new method is aimed at the above – stated disadvantages eliminating of the existing technical solution and, moreover, of its use, can be obtained by a more reliable technical result: the natural water overflow obtaining, through the impervious discontinuity layer, and the water flow from the top to the bottom of the aquifer, the system reliability increasing, and also the works simplification at the installation.

This is, practically, achieved by the fact, that in the process of the draining soil drainage method, having included the wells formation, the ground waters bypass and the removal of them, it, moreover, is proposed to be used, as the common dehumidifying chamber wells, as well as the bore drainage purifying drains, having radiated by the beams into the subsurface and the subsoil filtration zone, where the accumulation of the large amounts of the moisture is, practically, taken its place, having based on the dense layer of the impervious clay. According the filtered beam drains, the water is flowed down into the dehumidifying chamber, from which it is pumped by the pump.

So, the new method efficiency is consisted in the following combination of the essential features, sufficient for the above – mentioned technical result achieving. This is ensured by the fact, that a more improved method of the drainage drying out, which is provided the purifying filtered beam and the radial drainage drying out systems, in which:

– the drainage is occurred, at the expense of the purifying filtered drains, having diverged rays in the subsurface (e.g. ground water) filtration zone, where the accumulation of the large amounts of the moisture is, practically, taken its place, having based on the dense layer of the impervious clay. According the filtered beam drains, the water is flowed down into the dehumidifying chamber, from which it is pumped by the pump for the industrial consumption (e.g. the fountains, the watering, the irrigation and the other water use for the economic purposes and the household needs);

– the drainage is occurred by the filtered drains, having located under the top surface and the under topsoil layer in the active filtration zone, the water is accumulated in the well, which is cut the impervious layer, and it is poured into the underlying aquifer;

– the drainage is taken its place by the filtration radial drains, having situated and disposed in the layer under the sand and the gravel bed plant, under the top surface and the under topsoil layer for all that the water is flowed down into the common dehumidifying chamber, and thence it is fallen into the underlying aquifer;

– the drainage is occurred by the filtered radial drains, for all that there is the process of the under waters collecting and the dumping them down into the two underlying aquifers, without further preliminary collecting them in the dehumidifying chamber, moreover, the deviated and the inclined wells are also may be used, having penetrated into the underlying ground water carriers.

Thus, the special device for the dehumidifying drainage system is consisted in: the general drying chamber, having made reinforced concrete; the pump for the water pumping; the concrete slab; the measuring piezometer, having combined with the vent pipe; the manhole; the running staples; the pebble – sandy layer; the radial drains with the filtered part; the impervious layer (e.g. the hydro – aquiclude); the wells.

1. The local drying out soil method by the drainage is, practically, to be optimized the water distribution and its further allocation and, moreover, the drainage waters to be re–used in the industry – domestic purposes.

2. The local drying out soil method by the drainage with the water reduction is a more economical one – it is, practically, allowed, without the additional energy – intensive costs use, to be prepared the grounds for the construction of the modern underground structures, the facilities, and the installations.

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THE TURBULENT JET FLOWS RESEARCH

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The mechanism for the artificial turbulent jets creation, on the basis of the ejection principle, has been, previously, described. Corresponding to this mechanism, we have the addition of the wells sand reduction method, and also the device for its further implementation. The jet streams use, at the wells cleaning, is connected with the two main factors:

1) the impurities' removal (e.g. the sand particles) of the turbulent jet;

2) the impurities diffusion transport increase outside the jet;

3) the temperature inversion violation in the well, having created, in result of the sand addition.

Among these above – listed factors, the notable one is the first factor, the other two ones are presented and associated themselves the related and the ancillary conditions, having initiated by the first one.

So, the two air flows interaction (e.g. the generated and the complexing, the upwelling and the downwelling ones) is resulted in the velocity fields, the pressure transformation, and, eventually, – the impurities field transformation (e.g. by its sizes and the sand particles concentration).

So, on the basis of all these provisions, it has been made the mathematical modeling of the wells cleaning process by the turbulent flows, having generated with the ejection using.

This model is included in itself the two sub – models.

Thus, the first of them, is described the impurities concentration change in the turbulent jet, at the moment of the clearance mechanism action; and the second one – outside of the jet.

So, the state variable of this first model, we'll denote $C_1(x)$, and the second one – $C_2(z, t)$. Then, the calculating formulae, having obtained, on the basis of all these models, are taken the following form:

$$C_1 = \frac{\omega}{4\pi D_x^x} \exp\left[-\frac{\nu(H^2 + y^2)}{4D_x X}\right], \qquad (1)$$

where D – the diffusion coefficient of the impurities; υ – the velocity of the air stream; q – the flux density (e.g. «the power») impurities source; H – the well height; (x, y) – the coordinates of the points of the horizontal plane.

Having differentiated (1), and equated to the zero, the derivative value $\partial C_1/\partial x$ at the point $x = x_{max}$, in which the maximum concentration is achieved at the lower boundary of the well (e.g. as the functions C_1 from the distance x and the diffusion coefficient D).

Having taken $y = 0$, from the following condition:

$$\frac{\partial C_1(x)}{\partial x} = 0, \qquad (2)$$

we get $x = x_{max}$:

$$x_{max} = (VH^2)/(4D). \qquad (3)$$

The time, over which the maximum concentration is achieved, at the fixed distance from the turbulent jet axis (for example, at the distance r), is equal to the following:

$$\tau_{max} = \frac{r^2}{4D}. \qquad (4)$$