

Land plots of reclamation territories: construction and ecology-legal issues

Elena Voskresenskaya^{1*}, *Lybov Vorona-Slivinskaya*², and *Yury Tilinin*²

¹Peter the Great St.Petersburg Polytechnic University, Polytechnicheskaya str., 29, 195251, St. Petersburg, Russia

²Saint Petersburg State University of Architecture and Civil Engineering, 2nd Krasnoarmeyskaya str., 4, 190005, St. Petersburg, Russia

Abstract. The article focuses on the peculiarities of legal relations on using beds and aquatic areas of water bodies, protective shorefronts and water protection zones when creating reclamation grounds as parts of the urban environment. The authors mention that there are no particular sections of land and town-planning legislation required to regulate this process, and the legal status of beds of water bodies is not defined in the legislation. Beds of water bodies belong to water fund lands; therefore, creating reclamation grounds requires a decision on the provision of land plot in a protective shorefront or in water protection zone and a land plot on the bed of a water body. The authors conclude that modern technical means allow determining the site line for creating reclamation grounds. Purposeful human activity aimed at the transformation of environment leads to creation of a territory, which firstly should respond to the attributes of safe environment, and secondly may have attributes of a land plot as a real estate object: in other words, it will be a natural-anthropogenic object. The present paper substantiates the proposals on the need for changes in the legislation governing the procedure for the creation of reclamation grounds.

1 Introduction

In July 2011, a special law was adopted that regulates relations on the creation of reclaimed land plots on water bodies [1]. The legislation considers a land plot created on a water body as a construction, yet the term “land plot” is used to designate it. Thus, according to a special Law on reclaimed land plots on water bodies, such a land plot can be a man-made structure: reclaimed land plot that has the status of a structure. A reclaimed land plot on a water body will regard to natural man-made objects.

On the issue of the term chosen by the legislator in the special Law on Reclaimed Land Plots, the following should be noted. The study of the problems of terminology was carried out in articles of N.N. Melnikov [2], E.A. Maltseva [3] M.V. Matveeva [4], D. Khustov [5] and other authors. In the complex of the legal issues of construction on reclamation grounds and ecology were not considered. However, the scientific development of these problems is

* Corresponding author: elenvoskr@mail.ru

far from being completed. Some problems of ecology and territories were studied by the authors of the present scientific article: E. Voskresenskaya, [6-14], L. Vorona-Slivinskaya [8, 11-14].

2 Materials and Methods

The main methodological way of this research is adopted system approach, which is providing the maximum possible the account of all aspects of the problem. Also author used statistics, abstract-logical and historical methods. The materials for this research were normative legal acts, official and other reports and works of other scientists. To a certain extent, the findings and results are based on the experience of the author (he was collecting and was analysing the materials on this topic during all period of land reform in modern Russia). In addition, the author of this article was more than 20 years directly involved in preparing the relevant decisions and their correction).

The legislation designates the preparation of territory planning documents within the planned lines of the reclaimed land plot and project documentation, as well as the performance of engineering surveys as the part of the work on the formation of a reclaimed land plot on a water body. When conducting engineering surveys, natural conditions and factors of anthropogenic impact are studied for the rational and safe use of territories and land. The monitoring and accounting of the impact of the activity on creating reclaimed land plots on various components of the natural environment, natural objects are not considered as obligate in the legislation. However, there is an impact on a water body, aquatic bio-resources, a bed of a water body, flora and fauna of a coastal territory after changing the boundaries of such an object. Depending on the area of the reclaimed land plot created on a water body, the time of its construction and exploitation, there is different effect.

To educe the specifics of legal relations on the creation of reclamation grounds, it is necessary to pay attention to objects that are influenced by the creation of such territories and legal consequences that may arise after their creation. At the same time, the main goal of the formation of reclamation grounds should be taken into account: the creation of conditions suitable for human life and activity, which should be safe and environmentally friendly. Because of the economic impact, there is a transformation of the appearance of a water body and a shorefront as natural objects [9]. There is an initial impact on a water body and on lands in water protection zones. Activities on creating reclamation grounds are carried out on beds and in aquatic areas of water bodies, in coastal protective zones and water protection zones. As a result, a terrain (land surface) is created. The formed land surface is divided into zones and land plots that have different types of permitted use depending on the needs, to satisfy which the reclamation ground is created. Reclamation grounds are usually created in order to expand urban territories suitable for building constructions of various purposes, with the provision of utilities. Creation of such territories provides the formation of zones and land plots with a special legal status.

3 Results

The creation of reclamation grounds is firstly relevant and important for major coastal cities. The study showed that the range of objects that are influenced by the creation of reclamation grounds is much wider than it is defined in the special law on reclaimed land plots on water bodies [1]. Currently, the legislation has adjusted only legal relations arising in connection with creating a reclaimed land plot on a water body (result of activity). The analysis of the law standards, under which the provision of a land plot and a water body is not obligate, allows concluding that the goal was to simplify the procedure for obtaining

permission to create a reclaimed land plot on a water body. The impact of such activities on the environment and monitoring the development of this impact after the creation of a site are also not obligate according to legislation. Certain problems may arise in law enforcement due to inclusion of project documentation regarding reclaimed land plots, that are planned to be build on water bodies owed by the Russian Federation, into the list of environmental impact assessment. The reason is that the law does not define, what regards to such documentation, who determines the volume of documentation. The Town Planning Code of the Russian Federation [9] does not define the content of such documentation as well.

Today there are certain legal problems with alluvial territories. For instance, "Zinger-development" company was disallowed to sluice 2 square kilometers of shore in the waters of the Gulf of Finland for the construction of elite residential complex "Zaliv ostrovov".

The results of studying the influence of alluvial shores on the level of water rise in the Neva Bay during floods, conducted by the North-West Directorate for Hydrometeorology and Environmental Monitoring [14, 15] became the most convincing argument of opponents of that development project. Specialists from Russian meteorological service Rosgidromet stated that the construction of new alluvial areas in the Neva Bay is highly undesirable.

The survey results appeared after October 30, 2018, when the Arbitration Court of St. Petersburg and Leningrad Region sustained the claim of OOO "Zinger-Development" for declaring illegal the refuse to approve the washing-up of an artificial land plot for residential complex "Zaliv ostrovov" in the Gulf of Finland near Olgino village and obliged the government of St. Petersburg to give approval for the project. The appeal instance cancelled the decision on February 12.

The territory for the planned alluvium is under the federal ownership. The project was successfully approved in all federal departments, but was rejected by the city Property Relations Committee [16]. This rejection was avoided in the first arbitration instance, but considered legitimate in the second one.

The development project is declared on a total area of 200 hectares, which should accommodate 5.2 million square meters. meters of real estate: 1.8 million commercial and 3.2 million residential. Housing business and elite class, therefore, the number of square meters per person here should be approximately equal to European standards - that is, 40-50. Based on this, from 64 to 80 thousand people could live on the archipelago - in residential "clusters" grouped into something like an atoll, each cluster into six thousand people. The volume of announced investments is 400 billion rubles, which is comparable with the revenue part of the budget of St. Petersburg for 2018 (538.7 billion).

The authors assume that besides project documentation, the environmental impact audit should also cover the results of engineering surveys and architectural design process, license for construction and an agreement on the creation of a reclaimed land plot on a water body.

4 Discussion

At present, various terms are used: "reclamation ground", "reclaimed land plot", "artificial island". It is important for legislator to choose a term that will reflect the specifics (attributes) of the land plot being created on a water body that is suitable for human life and activity. The purpose of creating reclamation grounds, as mentioned earlier, is precisely to create a land plot suitable for human life and activity. However, human activity in this area can be different. The authors consider it permissible to use the term "reclamation territory", since such a definition characterizes the ecological and legal aspects of legal relations when creating territories suitable for human life and activity.

When making decisions on the creating reclamation grounds, public authorities implement their public functions, provide a safe and favorable environment for the life and activities of citizens. The use of the term "territory" will provide public law regulation of relations when creating reclamation grounds. This particular choice of the term will determine the status of the future reclamation ground suitable for human life and activity as a zone with special conditions of use. The rules governing the creation of reclaimed lands should have a public-legal nature. If associating the term "reclamation territory" with the land, the use of such fiction will reduce the activity to the creation of a real estate item only. In this case, the regulations will be civil in nature. It should be noted, that several land plots are always allocated in a reclamation territory. The land plots created as a result of human activity in a reclamation territory become part of the territory of the settlement and have a different legal status. Table 1 presents the types of land in the Russian Federation [17].

Table 1. Land area.

Indicator	2015	2016	2017
Land area – total, mln. hectares, including:	1712.5	1712.5	1712.5
- agricultural land	220.2	222.3	222.0
- forest land	871.8	870.7	870.7
- surface water воды, including wetlands	225.0	226.8	226.8
- other lands	392.9	392.9	393.0

Regarding the specifics of nature use, when creating a reclaimed land plot on a water body, it should be noted that water use is the main type of nature use, since an aquatic area and a bed of a water body are used and the line of a shorefront changes. Therefore, the boundary and area of a water body change. The purpose of water use is the creation of reclamation grounds suitable for human life and activity.

The specifics of relations on the use of the land surface in a coastal protective zone and water protection zone, as well as a bed and an aquatic area of a water body as a spatial and territorial basis are manifested in the consequences for the participants of such legal relations. As a result of the creation reclamation grounds, a part of a populated locality is formed. At present, this aspect is not taken into account in the law on reclaimed land plots on water bodies.

Land surface as a spatial and territorial basis is used when implementing the urban planning activities. The land legislation designates beds of water bodies as the lands belonging to the water fund.

Thus, as mentioned earlier, the priority principle of regulation of legal relations on creating reclamation grounds suitable for dense living of people should be the principle of ensuring safe conditions for human life and activity. The authors assume that the use of the term "reclamation territories" provides the integrated approach to the regulation of legal relations on the creation of such territories. Environmental standards regulating the impact on beds and aquatic areas of water bodies, on land plots of shore protective fronts and water protection zones should be elaborated and adopted when designing and building a reclamation ground suitable for human life and activity.

In the master plan of developing St. Petersburg, approximately 1000 hectares are intended for alluvial islands. It is of acute need for modern St. Petersburg, with its population of over five million people.

The project of soil sluicing is being developed by an organization that designs the structures build from ground materials by means of hydraulic mechanization based on a project of engineering site preparation for construction; the master plan of the city or a detailed plan for the neighborhood; a master plan for the construction of an industrial facility or a design project for building up the territory with separate structures.

When a projected alluvial area is located on a bank of a river, natural reservoirs or reservoirs or in their water area, the surface marks of the washed mass are set based on the requirement to protect the area from flooding when the maximum design levels of high waters are reached.

Depending on the type and class of designed structures, 0.1–5% maximum level security is taken. Exceeding this level by surface marks of an alluvial area (taking into account the height of a wave and its surge in the reservoir) must be at least 1 m. In addition, the distance between buildings and structures and the shoreline should be taken into account, as well as the nature of underground facilities and communications; the minimum allowable depth of groundwater under the structures, the availability of engineering protection systems (dams, drainage, etc.) contained in the project. When the projected alluvial area is located on high floodplain terraces or a watershed outside the influence of flood waters and reservoir levels, the elevations of the washed-in massif are determined by general construction, including planning and decisions. The project should include a zonal recourse, which corresponds to the creation of different classes of alluvial areas.

Alluvial areas of category I should be built from well-permeable soils (F_f is more than 10 m/day), which have rapid water loss, compaction and acquiring the following characteristics by the time of construction: relative density coefficient $J_d \geq 0.5$; total strain modulus $E \geq 30$ MPa; design resistance $R \geq 3$ MPa.

Alluvial areas of category II should be built from soils, the water permeability of which, is characterized by filtration coefficient values of not less than 4.5 m / day (which provides satisfactory water loss, compaction and eliminates the possibility of flooding of the alluvial territory from infiltration or barrage effect) start of construction values $J_d \geq 0.4$; $E \geq 20$ MPa; design resistance $R \geq 0.2$ MPa.

Alluvial areas of category III are not subject to strict regulation on the characteristics of soils, with the exception of sanitary and hygienic and agromeliorative requirements.

The reclamation works are quite specific and their cost depends not only on the area of the newly formed territory and the amount of dredging, but largely on the volume of environmental and social issues (for example, resettlement of residents from territories adjacent to the construction radius). The cost will be over a million dollars per 1 ha. At multi-storey building, the costs for reclamation are not so significant and amount to about \$ 200 / sq. alluvial land. This is only the creation of a land plot without taking into account roads, communications, landscaping. The cost of an alluvium at a depth of 5 meters costs about \$ 120 / sq. m of the area obtained.

Thus, two more drained sites for the construction of low-rise residential complexes within the framework of project “Noviy bereg” may appear in the waters of the Gulf of Finland by 2029. The project of Zinger Development company is also promising: the developer plans to develop two hundred hectares of water for the new urban area. Residential and business districts, shopping centers, parks will appear on an artificial island, and there will be a separate road network connecting the separate territory with the city.

Alluvium will not be economically viable as long as there is a sufficient amount of land in St. Petersburg that does not bring commercial income to its owners. This is a huge industrial area almost in the center of the city, and free sites on the outskirts. The cost of sluice instantly makes higher the cost per square meter in a future residential project. Since the cost of the work is high enough, it is necessary to build housing belonging to class “comfort+” and higher, among other reasons in order to recoup the project. The procedure for obtaining permission for reclamation is rather complicated and costly, taking into account the fact that the entire water area is in federal ownership.

For 10 years, the volume of investments in alluvial shores in St. Petersburg has reached 40 billion rubles. This volume includes the price of 34 hectares, while 89 hectares are planned to be developed. The average profitability will run at 20-25%. At the same time,

the costs for the construction of apartments and associated infrastructure are estimated at 80 thousand rubles for 1 square meter of housing. On 34 hectares, about 500 thousand square meters of comfort class housing and 30 thousand square meters of built-in premises with a social infrastructure will be built.

Therefore, when creating reclamation territories suitable for human life and activity, the integrated environmental management is performed. Since reclamation grounds are created within the framework of construction activities, each of its stages (design, construction, operation) should be regulated in accordance with environmental requirements. At the same time, special attention should be paid to the mandatory scientific support of such activities at all its stages.

5 Conclusions

When creating reclamation territories, it is necessary to designate aquatic areas and beds of water bodies, coastal protective fronts and the water protection zones as the objects of impact. Such activities should be designated as a complex environmental management by its nature, when water use is the main type of natural resource use. As a result of water use, a transformation (change of appearance) of a bed and shore of a water body is carried out in order to create reclamation grounds, an aquatic area of a water body and its boundaries change, and a surface area of the land increases. Creation of reclamation grounds can be the purpose of water use.

Land use is the second most important type of environmental management when creating reclamation territories. As a result of land use, boundaries of water protection zones of a water body change (replaced towards its aquatic area). Therefore, the following actions are necessary:

- special regulation of the procedure for the use of such land plots from the initial stages of creating reclaimed land (reservation for construction in connection with state or municipal needs);
- scientific support of activities for the creation of reclamation grounds from the stage of engineering surveys until the end of the process of creating reclamation territories. The division of the land surface into zones or land plots; use of such land plots for the construction of buildings and structures, including utilities, providing the supply of gas, heat, water, power and drainage services to buildings placed in reclamation grounds.

Reclamation territory should be designated as a zone with special conditions of use, taking into account the increased safety requirements for the creation (construction) and operation.

Such activity should be carried out on the basis of the agreement. The agreement on the creation of a reclaimed land plot is a mixed (investment) contract, in accordance with which a state body or local government body undertakes to ensure the approval of documentation on the area planning.

A concession agreement can also be a legal form of regulation of activities to create reclamation territories. Such an agreement should provide conditions for the timing, order and procedure for the transformation (change) of a bed and shore of a water body, a coastal protective front and a water protection zone of a water body.

Thus, there is a need to introduce a special section of the Town Planning Code of the Russian Federation, concerning the regulation of dividing reclamation territories into land plots and zones, with defining the types of permitted use. The rights and obligations for the land use in reclamation territories should also be governed by the contract. In the case of the acquisition (transfer) of rights in land plots, such an agreement should provide the possibility of adding buildings, facilities and structures located in those reclamation territories. Features of the use of such land plots are conditioned by restrictions on real

estate development rights due to increased requirements for construction, repair and restoration work on objects located on reclamation grounds (for example, when building underground structures).

The features of property relations when creating reclamation grounds using frameworks of investment, concession and acquisition contracts, are the subject of further research after creating a reclamation ground.

References

1. N.N. Mel'nikov, Zhurnal rossiyskogo prava **1**, 4-9 (2011)
2. E.A. Maltseva, Gosudarstvennaya ekologicheskaya ekspertiza: problemy i protivorechiya deystvuyushchikh norm prirodookhrannogo zakonodatel'stva **2**, 19-32 (2014)
3. M.V. Matveeva, Ekologicheskaya ekspertiza kak etap razvitiya lend-developmenta **4**, 33-36 (2013)
4. D. Khustov, Problemy pravovogo regulirovaniya ekologicheskoy ekspertizy na sovremennom etape **5**, 29-44 (2012)
5. E. Voskresenskaya, V. Snetkov, A. Tebryaev, Z. Askarov, 2017 MATEC Web of Conferences **106**, 08055 (2018)
6. E. Voskresenskaya, V. Snetkov, A. Tebryaev, E3S Web of Conferences **33**, 03051 (2018) doi.org/10.1051/e3sconf/20183303051
7. E. Voskresenskaya, L. Vorona-Slivinskaya, E3S Web of Conferences **33**, 03052 (2018) <https://doi.org/10.1051/e3sconf/20183303052>
8. E. Voskresenskaya, D. Mokhorov, A. Tebryaev, Matec Web Of Conferences **170**, 01058 (2018) DOI: <https://doi.org/10.1051/matecconf/201817001058>
9. E. Voskresenskaya, N. Zhil'skiy, E. Shariapova, Matec Web Of Conferences **170**, 01057 (2018) DOI: <https://doi.org/10.1051/matecconf/201817001057>
10. Pak Khe Sun, L. Vorona-Slivinskaya, E. Voskresenskaya, IOP Conference Series: Earth and Environmental Science **90** (2018) <https://doi.org/10.1088/1755-1315/90/1/012073>
11. E. Voskresenskaya, L. Vorona-Slivinskaya, S. Panov, MATEC Web of Conferences **193**, 02025 (2018) doi.org/10.1051/matecconf/201819302025
12. E. Voskresenskaya, L. Vorona-Slivinskaya, A. Loiko, Constitutional-legal issues of ensuring environmental safety in modern Russia **8(19)**, 57-59 (2018)
13. E. Voskresenskaya, L. Vorona-Slivinskaya, A. Loiko, Economic and legal problems devastated territories in the Russian Federation **7(18)**, 62-65 (2018)
14. M.S. Usoltceva, Yu.V. Volkova. Construction of Unique Buildings and Structures **2**, 29-30 (2015)
15. N.Arefie. Yu.Volkov Ecological balance, 26-28 (2018)
16. N.Arefie. Yu.Volkov Scientific and technical statements **49**, 138-141 (2018)
17. *Russian Statistical Yearbook 2018: Stat .book* (2018)