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ON THE QUESTION OF THE RULES OF WORK DESIGN IN LAND MANAGEMENT

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Abstract. *Scientific and methodological approaches to the development of working land management projects for the implementation of measures for reclamation of disturbed lands, removal and transfer of fertile soil, conservation of degraded and unproductive lands, improvement of agricultural and forestry lands, protection of lands from erosion, erosion, flooding, landslides, compaction, acidification, pollution by industrial and other wastes, radioactive and chemical substances, developed the structure and content of such projects.*

It was found that in order to restore the disturbed land areas and prevent their harmful effects on the natural environment, it is necessary to rehabilitate the land, which consists of a set of technical and biological measures aimed at creating optimal cultural landscapes with productive soil cover. The process of reclamation always takes into account the formation of landscapes and the creation of an appropriate natural environment, and not always the task of restoring the original state of the natural environment and land, but usually achieves a harmonious solution to many environmental and social issues.

A set of qualitative and quantitative indicators, parameters governing the development of working land management projects, taking into account environmental, economic, social, climatic and other conditions.

The scientific and methodical approaches and basic normative and legal documents to the development of working land management projects are analyzed.

Key words: *reclamation of disturbed lands, grounding, working land management project, soil cover, fertile soil layer*.

Problem statement. The care for the reproduction and rational use of soils is a particularly responsible function of the state. It is important to preserve for present and future generations the soils, which are the product of a long natural and anthropogenic process, on land of all forms of ownership in rural and urban areas. Moreover, the protection of those soils comes to the fore, the study of which until recently was not considered a priority, in particular the soils of settlements and suburban areas. Life brings soil scientists "face to the city", because at least 50% of the world's population lives in an urbanized world [15]. However, in recent years there has been a trend of careless treatment of soils, deterioration of their fertility, destruction of the soil layer of productive lands during construction, exploration, mining and other works. When performing these works, the most important thing is that the soil cover is disturbed and separated over large areas. In the best case, the fertile layer of soil is stored somewhere, and for the most part disappears without a trace, ie for the biosphere is lost forever. According to Articles 48 and 52 of the Law of Ukraine "On Land Protection", when carrying out urban planning activities and conducting mining, exploration and other works related to soil disturbance, landowners and land users must remove and store in certain places a fertile layer of soil with its subsequent use for the improvement of unproductive lands, land reclamation and improvement of settlements and industrial zones [13]. The development of these working land management projects, taking into account the scale of intensive construction, which is carried out mainly at the expense of agricultural land, is extremely important.

Existing scientific and methodological approaches to reclamation of unproductive lands, removal and transfer of fertile soil layer, conservation of degraded and unproductive lands, improvement of agricultural and forestry lands, protection of lands from erosion, flooding, waterlogging, secondary salinization,

drying, industrial and other wastes, radioactive and chemical substances developed during the Soviet era, require mandatory rethinking not only from an economic but also from an environmental point of view. Areas of land reclamation should be determined taking into account such factors as the nature of the disturbed land and the need for specific land in specific regions..

Regulatory documents in the field of standardization of the former USSR, in particular, GOST 17.4.3.02-85 “Nature protection. Soils. Requirements for the protection of the fertile soil layer during excavations”, GOST 17.5.3.06-85 “Nature protection. Lands. Requirements for determining the norms of removal of the fertile soil layer during excavations”, GOST 17.5.1.02-85 “Nature protection. Lands. Classification of disturbed lands for reclamation”, GOST 17.5.3.04-83 “Nature protection. Lands. General requirements for land reclamation”, GOST 17.4.2.02-83 “Soils. Nomenclature of indicators of suitability of the disturbed fertile layer of soils for grounding”, GOST 17.5.1.03-86 “Nature protection. Lands. Classification of overburden and host rocks for biological land reclamation”, GOST 17.5.1.06-84 “Nature protection. Lands. Classification of unproductive lands for excavation”, GOST 17.5.3.05-84 “Nature protection. Land reclamation. General requirements for grounding", etc. However, with the entry into force of the Law of Ukraine of 20.09.2019 № 124-IX "On Amendments to Certain Legislative Acts of Ukraine in Connection with the Adoption of the Law of Ukraine "On Standardization" in Ukraine was finally enshrined voluntary (optional) use of standards, resulting in uncertainty for developers of land management documentation on the application of qualitative and quantitative indicators to be used in the preparation of working land management projects, including norms for removing the fertile soil layer for land, directions of reclamation of disturbed lands. Lack of relevant regulations may lead to non-compliance by developers of land management documentation with requirements for land protection as the main national wealth.

The Law of Ukraine of 28.04.2021 № 1423-IX "On Amendments to Certain Legislative Acts of Ukraine on Improving the Management and Deregulation System in the Sphere of Land Relations" amended Article 54 of the Law of Ukraine of

22.05.2003 № 858-IV "On Land Management", according to which the rules for the development of working land management projects must be approved by the Cabinet of Ministers of Ukraine.

The purpose of the article is to highlight the scientific and methodological approaches to the development of land management projects for the implementation of measures for reclamation of disturbed lands, removal and transfer of fertile soil, conservation of degraded and unproductive lands, improvement of agricultural and forestry lands, protection of lands from erosion. salinization, drying, landslides, compaction, acidification, contamination with industrial and other wastes, radioactive and chemical substances, developed the structure and content of such projects in accordance with changes in land legislation of Ukraine.

Analysis of recent research and publications. In Ukraine, a significant number of scientists have studied this problem. First of all, this is the study of scientists such as V. Andrienko, T. Ievsiukov, S. Hlushko, M. Kozak, A. Koshel, N. Kuzin, S. Osipchuk, S. Pogurelsky, M. Stetsiuk, I. Shevchenko, M. Shkvyr and others. According to the study of issues related to the legal regulation of the development of working land management projects, we can highlight the work of such scientists as D. Dobryak, A. Tretyak, V. Drugak. The problems of land disturbance, erosion processes in the soil cover due to human economic activity were studied by D. Babmindra, S. Bulygin, O. Kanash, L. Novakovsky, V. Sayko. At the same time, some issues related to the development of working land management projects remain out of the attention of both scientists and the authorities.

Presentation of the main material of the study. The development of industry, transport, construction work, development of mineral deposits is inevitably associated with land disturbance. Disturbed lands are all categories that have lost their economic value or become a source of negative impact on the environment due to changes in soil and vegetation, hydrological regime and the formation of man-made relief. They are often a source of pollution of soil, water and air in the surrounding areas, deteriorating the hygienic living conditions of the population and the overall appearance of the landscape.

The state policy of land protection provides for the principle of rational nature management on lands of all categories, in which the violation of lands involves their restoration (land, reclamation).

Grounding - a set of works on the removal, transportation, application of fertile soil and potentially fertile soils on unproductive lands and disturbed lands in order to improve them. Grounding, in essence, is an environmental measure performed in a set of land management works that have an investment nature and aimed at preserving the natural environment, increasing the productivity of agricultural land [16].

Under market conditions, the concept of "reclamation" is expanded to include the removal of fertile soil and potentially fertile rocks in the construction of reservoirs, quarrying, construction work with the excavation of the fertile soil layer and their application not only on unproductive land in agricultural enterprises, but also in within the urban zone, in the organization of green zones of industry (for landscaping). In these cases, soil with a certain fertility potential is a commodity that has a market demand and a certain value.

Reclamation is of social importance in educating a caring attitude to natural resources and, in particular, to the country's land resources.

The working project is a document that takes into account the basic requirements that must ensure: preservation and rational use of the main wealth - land; observance of the order and the rules directed on preservation of the natural environment which are carried out in a complex of land management works; smoothing of harmful influence on economic activity of the agricultural enterprise of the factors arising in connection with development of a site under construction, transportation of soil and other works influencing agricultural production and health of people; preservation of the fertile layer of soil and its use for agricultural production, improvement of soil as a cover in the green zone of cities or other purposes; prevention of degradation, pollution and other violations inevitably occur when withdrawing land for non-agricultural purposes [16].

Working land management projects are developed to implement measures for reclamation of disturbed lands, removal and transfer of fertile soil layer, conservation of degraded and unproductive lands, improvement of agricultural and forestry lands, protection of lands from erosion, flooding, waterlogging, secondary salinization, acidification, contamination by industrial and other wastes, radioactive and chemical substances.

Working land management projects are developed as a set of economic, design and technical documents for land use and protection, including calculations, descriptions, drawings of technical solutions, estimates, the implementation of which is expected to be carried out within the period established by this project.

The graphic part of the working land management projects reflects the existing (if any) and design boundaries of land management objects, information on which must be entered into the State Land Cadastre in accordance with the Law of Ukraine "On State Land Cadastre", drawings of technical solutions.

Working land management projects for the reclamation of disturbed lands

The purpose of development of working projects of land management of reclamation of the broken lands is definition of the basic design decisions providing the most effective use of the reclaimed sites; establishing the volume, technology and sequence of production of restoration works; determination of the estimated cost of reclamation.

Execution of design works depending on the types of disturbed lands, their qualitative characteristics, peculiarities of local conditions, duration and production related to land disturbance, mining or construction works, the accepted direction of further use of regenerated lands.

Tasks for drawing up a working project of land management should include: the name of the object and its area; location of the object; the purpose of the reclaimed site; thickness and method of removing the fertile soil layer, method and place of its storage or intended use; measures to combat soil erosion in the reclaimed area; special conditions for mining works depending on the type of development

(longitudinal slopes of the planned area, measures to divert and reduce groundwater levels, construction of access roads, etc.); the content of works on biological reclamation and conditions of their performance (terms and norms of fertilizer application, area of alkalinization and composition of grass mixtures, measures on chemical reclamation, etc.); terms of completion of works on mining reclamation.

Topographic surveys conducted during the formation of land and construction projects may be used in the preparation of working land management projects for the reclamation of land disturbed in connection with the construction of industrial facilities and in the development of deposits.

Soil and agrochemical survey in the preparation of working land management projects for the reclamation of disturbed lands should include obtaining chemical characteristics of the soil mixture (salinity, toxic substances, acidity, determination of soil and agrochemical conditions in the adjacent area).

Reclamation of disturbed lands involves a set of works aimed at restoring the productivity and value of disturbed lands, as well as improving environmental conditions. Disturbed lands include lands that have lost their economic value as a result of economic and other activities (mining, construction and other works) or are a source of adverse environmental impact due to the formation of man-made relief, changes in hydrological regime and the nature of soil cover, with complete or partial loss of fertility [8].

The method of reclamation and the direction of further use of disturbed lands are designed depending on the nature of the violation and man-made relief:

Lands disturbed during opencast mining [1]:

Basin-ridge quarries formed during the development of peat by hydropower have a depth of 5-10 m, a slope of more than 30°, with continuous planning can be used for hayfields and pastures, with partial planning - for reservoirs for various purposes.

Trench-ridge quarries formed during the development of peat by machine-forming method have a depth of trenches alternating with jumpers, 1-5 m, slope slope

over 45°, with continuous planning can be used for afforestation, with partial planning - as reservoirs and water-regulating afforestation.

The leveled quarry excavations formed during the development of peat by milling have a relative depth of 1–5 m, are used in continuous planning under arable land, and in partial planning - as hayfields and pastures.

Terraced quarry excavations formed during the development of deep-type mineral deposits in several ledges, with slopes of more than 45°, with continuous planning can be used under reservoirs (with anti-erosion plantings above the water mirror), with partial planning - for construction sites and placement of production waste dumps.

Basin-shaped quarries formed during the development (in one ledge) of mineral deposits of horizontal or gentle fall, in continuous planning used for agricultural land, in partial planning - for reservoirs and sites for waste heaps.

Depressive quarries formed during the development of low-capacity deposits (up to 5 m) in continuous planning are used under arable land, in partial planning - for pastures, forest plantations, fish ponds.

Deep upland-terraced quarries, formed during the development of deposits of high-depth type of sloping or steep fall, with transportation of the opening to external dumps, with slopes over 45°, depth more than 15 m, with continuous planning used for reservoirs (in deep part) and under perennial plantings (in the upland part), without planning - under anti-erosion plantings in the upland part.

Bottom ditches formed during the development of underwater deposits are used for reservoirs for various purposes.

Dumps are internal, formed during the dumping of rocks within the contour of the quarry: plateau (single-tiered with a flat surface) is used under arable land, hayfields, pastures, afforestation; plateau-shaped terraced (multi-tiered) used for arable land, hayfields, pastures, perennials; ridge-shaped dumps with continuous planning are used for agricultural lands, without continuous planning - for afforestation.

External dumps formed outside the quarry contour: plateau-shaped and terraced medium-high (15–30 m) external dumps are used for arable land, hayfields, pastures; high (30–100 m) - for perennial plantings on the plateau and anti-erosion plantations on slopes and terraces; ridge-shaped external dumps are used for anti-erosion afforestation.

Lands disturbed during mineral processing:

Dumps plateau-shaped and plate-shaped terraced, formed as a result of hydrotransportation of slag, ash and mineral waste, at a height of up to 30 m used (with continuous planning and measures to prevent toxic rocks) for forage, at a height of more than 30 m – for anti-erosion afforestation.

Heap-shaped and conical dumps, formed during the dumping of dry mineral waste, are used for anti-erosion afforestation.

Lands disturbed during underground mining:

Depressions formed during the development of minerals as a result of lowering the earth's surface with the rupture of rock continuity: the nature of the possible use of ring and canyon-like depressions with a depth of 5-15 m set in each case, based on the organization of the territory; hollow dips with a depth of 1.5–5 m are used for reservoirs, and with continuous planning - for reservoirs, forage lands; terraced dips, which are formed during the development of minerals in the conditions of sloping terrain, are used for hayfields and pastures, and with continuous planning - for hayfields and pastures, arable land.

Deflections (areas of the earth's surface that have fallen without the rupture of solid rocks) are used for hayfields and pastures, for continuous planning - for hayfields and pastures, arable land.

Dumps plateau-shaped and plate-shaped terraced are formed at dumping of hollow breeds: at height to 30 m use at continuous planning under hayfields and pastures, at partial planning - for antierosive plantings; at a height of more than 30 m - for afforestation.

Dumps ridge-shaped and conical (heaps) are used for afforestation.

Lands disturbed during the construction of linear structures:

Reserves (excavations formed during the extraction of rocks for the construction of embankments have a depth of 5-10 m) in continuous planning are used for arable land and forage lands, in case of partial planning - for reservoirs or afforestation.

Ditches, canals (excavations formed during the construction of catchments and drainage structures) are used based on local conditions.

Cavaliers, dams (earth embankments formed during the construction of hydraulic structures, storage of rocks removed from excavations) are used in accordance with the conditions of organization of the territory.

Blockage-like embankments formed by placing excess rock in the construction of pipelines can be used under arable land, hayfields, pastures.

Reclamation of disturbed lands is designed for technical and biological stages.

The stage of technical reclamation involves the preparation of land for their further use and includes: removal, storage and preservation of the fertile soil layer (potentially fertile rocks) with their transportation if necessary to a new place of laying; selective (layer-by-layer) formation of heaps; planning work on laying the slopes of dumps and excavations, leveling the surface of disturbed lands; application to the reclaimed surfaces of the fertile layer of soils or rocks suitable for the creation of reclamation strata; construction (if necessary) of access roads; anti-erosion, hydro-ameliorative and cultural-technical measures, including construction of hydraulic structures, drainage network (if necessary); uprooting of tree and shrub vegetation; cleaning of stones; removal of bumps, etc.

The stage of biological reclamation involves the restoration of land productivity, which is carried out after technical reclamation, and includes a set of agronomic and other measures to restore soil fertility for agricultural and forest lands, as well as water development, restoration of flora and fauna and eliminate the negative impact on environment.

When choosing the direction of further use of reclaimed land in the complex of works of the technical stage should include:

- removal of the fertile layer of soil from the disturbed area or adjacent to the disturbed area affected by reclamation, moving it to temporary dumps and storage in compliance with measures to eliminate deterioration of its quality and prevent water and wind erosion;

- performance (if necessary) of preparatory cultural and technical works on elimination of wood and bush vegetation, stumps, stones, construction debris, etc .;

- planning works on laying the sides of quarries, terracing the slopes of dumps, leveling and surface planning to ensure the conditions of storm and groundwater drainage and exclude the development of erosion processes, elimination of post-shrinkage phenomena;

- arrangement (if necessary) of drainage, drainage network and anti-erosion structures;

- construction (at reclamation of the fulfilled, peat areas) of the drainage network and the hydraulic engineering constructions providing drainage and regulation of humidity at operation of the reclaimed territory;

- chemical reclamation (if necessary) of toxic rocks or application to their surface of a shielding layer of potentially fertile rocks;

- moving the fertile layer of soil from temporary dumps and applying it to the prepared surface;

- final planning of the territory and (if necessary) work related to the transportation of the fertile soil layer.

The works of the mining stage of reclamation in the development of mineral deposits or construction materials, where the technology of production of mining works provides for the removal and storage of fertile soil, selective development of overburden, formation of slopes of quarry sides, filling the space with overburden following , additionally provided:

- cutting of crests of dumps and backfilling of depressions with simultaneous compaction of bulk rocks and creation of conditions of drainage following advancement of dump works;

- elimination of post-shrinkage phenomena after the cessation of intensive shrinkage of the surface and the formation of depressions on it, prone to waterlogging or those that interfere with the work of agricultural machinery;

- moving from temporary heaps of fertile soil layer and applying to the prepared surface.

In cases where overburden has significant water permeability, the work may include measures to create a layer of waterproof rocks.

When recultivating disturbed land plots for forestry use, the technical stage includes:

- laying the sides of quarries or terracing the slopes of dumps;

- surface planning in compliance with the conditions of creation of flat-wavy relief (without closed depressions) with slopes that prevent the development of erosion processes and allow the use of tillage, planting and other machines;

- implementation (if necessary) of measures for chemical reclamation of toxic rocks and reduction of groundwater or application of potentially fertile rocks.

At reclamation of quarry excavations of considerable depth or the fulfilled peat, deposits, quarry or a hydraulic way under artificial reservoirs of various, appointments as a part of works of a technical stage include:

- laying of shores, arrangement of convenient approaches and access roads;

- protection of the bottom and shores in order to prevent landslides, filtration or water breakthrough;

- construction (if necessary) of hydraulic structures.

Depending on the intended use of the reservoir in the working project of land management, fishery, sanitary and other requirements and standards must be met.

When determining the scope of work on the removal and storage of the fertile soil layer, it is necessary to take into account the area of emoval during reclamation, as well as the thickness of the removed layer. The size of the territory for the removal of the fertile soil layer is set by the project, based on the conditions of creating the necessary slopes, the organization of drainage.

The width of the strip of removal of the fertile layer of soil in the construction of pipelines and other underground communications is equal to the width of the opening of the trench floor, berms and the width of the strip of storage of mineral soil. When passing the route through forest lands, the width of the strip of removal decreases by the width of the strip of storage of mineral soil.

When removing the fertile layer in areas that after use can not be reclaimed into agricultural land, as well as in excess of this layer, the latter should be used to recultivate other disturbed lands or to improve unproductive lands. The fertile layer should be removed, as a rule, in the warm dry period of the year, and in areas occupied by crops - after harvest.

In the presence of toxic rocks that have a detrimental effect on agricultural and forestry crops, in the process of forming dumps, the latter should be laid in the base and covered with potentially fertile rocks at least 1.5 m thick.

The planned surface can have a one-sided slope, two-sided or in the form of a flat beam. To avoid waterlogging, it is not allowed to create closed depressions.

Surface planning of dump rocks in the agricultural direction of reclamation is designed in two stages: general, and in one or two years, after the end of intensive shrinkage - final. At development of the territory in arable land its surfaces provide slopes to 2°, in another case provide the slopes allowing to carry out anti-erosion measures. For forest lands, the longitudinal slope should not exceed 10°, transverse 4°.

If necessary, the reclaimed surface can be planned with terraces. Longitudinal and transverse profiles of the terrace canvas are accepted horizontally or with certain slopes.

The thickness of the applied fertile soil layer in the areas cultivated under arable land should be not less than the maximum depth of plowing, taking into account the subsidence of the applied layer.

On the surface of tailings, ash dumps, rocks fertile layer is applied after laying favorable for reclamation potentially fertile rocks.

The biological stage of reclamation involves a set of works aimed at restoring the fertility of disturbed lands.

In agricultural use, the biological stage includes:

- basic and pre-sowing tillage;
- application of organic and mineral fertilizers;
- sowing and caring for mastering crops;
- performance (if necessary) of chemical reclamation.

Types of fertilizers, doses and terms of their application, types of crops, mastering terms and norms of sowing, care, types and methods of chemical reclamation are justified by indicators that characterize the loose soil layer.

Compared to the doses recommended for intact lands, the doses of mineral fertilizers on reclaimed lands increase 1.5–2 times, manure - 2 times, seeding rates of perennial grasses 2 times [9].

Depending on the physico-chemical properties of soils (high acidity or alkalinity), the introduction of chemical ameliorants is envisaged.

During the reclamation of produced peatlands, measures are planned to intensify biological processes in the bottom layer of peat, including deep plowing, careful treatment of turf by milling or disking, application of copper microfertilizers.

In the working projects of forestry reclamation the assortment of wood and bush breeds is selected, technologies of planting and care of forestry are developed. Selection of species for afforestation is based on zonal conditions, physico-chemical, agrochemical and water-physical properties of soils, as well as the purpose of afforestation. For the formation of ecologically sustainable plantations, mixed types of forestry are created with the participation of the main species up to 60%, associated up to 20%, shrubs up to 20%.

The works of the biological stage of reclamation are designed to be performed by landowners (land users) to whom the reclaimed lands are transferred, at the expense of the funds provided in the budget for such works [9].

Working land management projects for the removal, transfer, application and use of the fertile soil layer

The purpose of the working land management project on removal, transfer, application and use of the fertile soil layer is to determine the scope of work on the rational use of the fertile soil layer accumulated or removed, development of technology and sequence of works, determine the cost of their implementation (hereinafter - land).

Preparatory work includes: selection and inspection of the object of land, collection and design of the necessary raw materials and documents, field survey.

Tasks for the preparation of a working land management project for the removal and transfer of the fertile soil layer should include: the location of the land on which the fertile soil layer is removed or transferred; characteristics of relief and soil cover; volumes of available fertile soil layer and its agrochemical characteristics; distance to the land plot (cadastral number if available), to which the fertile layer of soil is transferred; transportation route; types of works on preparation of the territory; power of applying the fertile soil layer; the direction of use of the area to which the fertile layer of soil is transferred, and its area; a list of measures aimed at protecting the site from water and wind erosion and increasing fertility.

The working project of land management on removal and transfer of a fertile layer of soil does not make in cases if movement of a soil cover (fertile layer of soil) is carried out within the same ground area given for personal peasant economy, gardening, construction and service of a house , outbuildings and structures (homestead), individual cottage construction or construction of individual garages.

The soil of land plots is subject to removal and transfer provided:

The mass fraction of humus in the lower limit of the fertile layer of soil to be removed is in natural and agricultural areas: Polissya - not less than 1%; Forest-steppe - not less than 2%; Steppe - not less than 2%; Steppe arid - not less than 1%; Carpathian mountain region - not less than 1%; Crimean mountain region not less than 1%.

The mass fraction of humus in the potentially fertile layer of soil that is removed is in natural and agricultural areas: Polissya - 0.5-1%; Forest-steppe - 1-2%;

Steppe - 1-2%; Steppe arid - 0.5–1%; Carpathian mountain region - 0.5–1%; Crimean mountain region - 0.5–1%.

The pH value of the water extract in the fertile soil layer is 5.5–8.2 (except for the Carpathian and Crimean mountain regions); in the soils of the Carpathian and Crimean mountain regions - not less than 4.0.

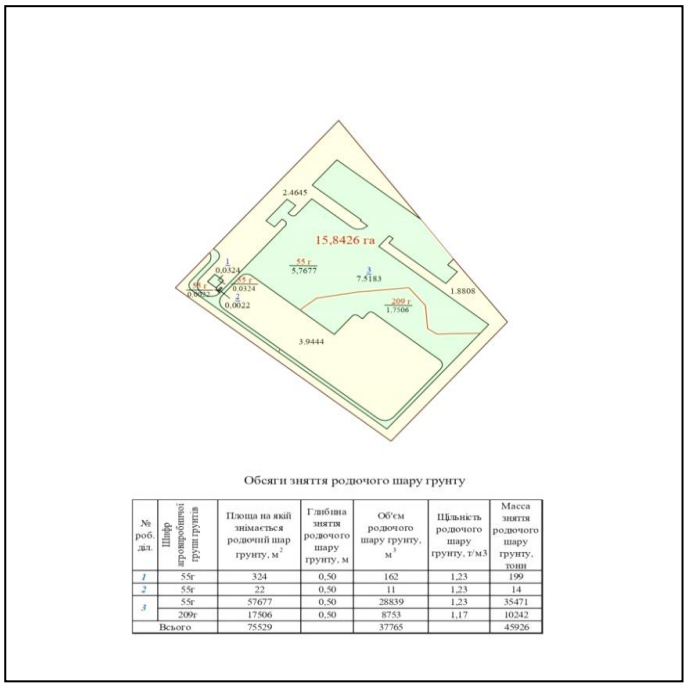
The pH value of the salt extract of sod-podzolic soils is not less than 4.5; in the peat layer - 3.0–8.2.

The mass fraction of exchangeable sodium (as a percentage of the cation exchange capacity) is: in a mixture of the fertile layer of chernozems, dark chestnut, chestnut soils and silt soils in complexes with solonetzes - not more than 5; weakly and medium-saline varieties of zonal and hydromorphic soils of forest-steppe and steppe zones - up to 15; on weakly and medium-saline varieties of low-humus southern chernozems, brown, chestnut soils and silt soils, as well as hydromorphic, semi-hydromorphic soils of the Steppe arid zone - up to 10.

The mass fraction of water-soluble toxic salts in the fertile soil layer does not exceed 0.25% of the soil mass or 0.5% when using the fertile soil layer in irrigated areas.

Mass fraction of soil particles less than 0.1 mm from 10% to 75% (except floodplain, delta sands and sand deposits); on floodplain, delta sands and sandy deposits - 5–10%.

The fertile layer of soil on soils with a strong degree of gravelly, strongly and very strongly stony, weakly, average and strongly washed away sod-podzolic, brown forest, gray and light gray forest is not subject to removal and transfer; medium and heavily washed dark gray forest, dark chestnut, sod-carbonate.



Обсяги зняття родючого шару грунту

№ роб. дил.	Шифр ґрунтоутворюючої групи ґрунтів	Площа на якій знімається родючий шар грунту, м^2	Глибина зняття родючого шару грунту, м	Об'єм родючого шару грунту, м^3	Щільність родючого шару грунту, т/м3	Масса зняття родючого шару грунту, тонн
1	55г	324	0,50	162	1,23	199
2	55г	22	0,50	11	1,23	14
3	55г	57677	0,50	28839	1,23	35471
	209г	17506	0,50	8753	1,17	10242
Всього		75529		37765		45926

Fig. 1 - Sample drawing of the designed measures for the depth of removal of the fertile soil layer

The rate of removal of fertile and potentially fertile soil layer H (in cubic meters) is determined by the formula:

H = M x S;

where M is the depth of removal of the fertile soil layer, m;

S is the area of the soil contour or group of soil contours with the same depth and quality of the fertile layer of soil to be removed, sq. m;

The rate of removal of fertile and potentially fertile soil layers H (in tons) is calculated by the formula:

H = M x S x d,

where M is the depth of removal of the fertile soil layer, m;

S is the area of the soil contour or group of soil contours with the same thickness and quality of the fertile layer of soil to be removed, sq. m;

d is the density of the fertile soil layer, t / cubic meter.

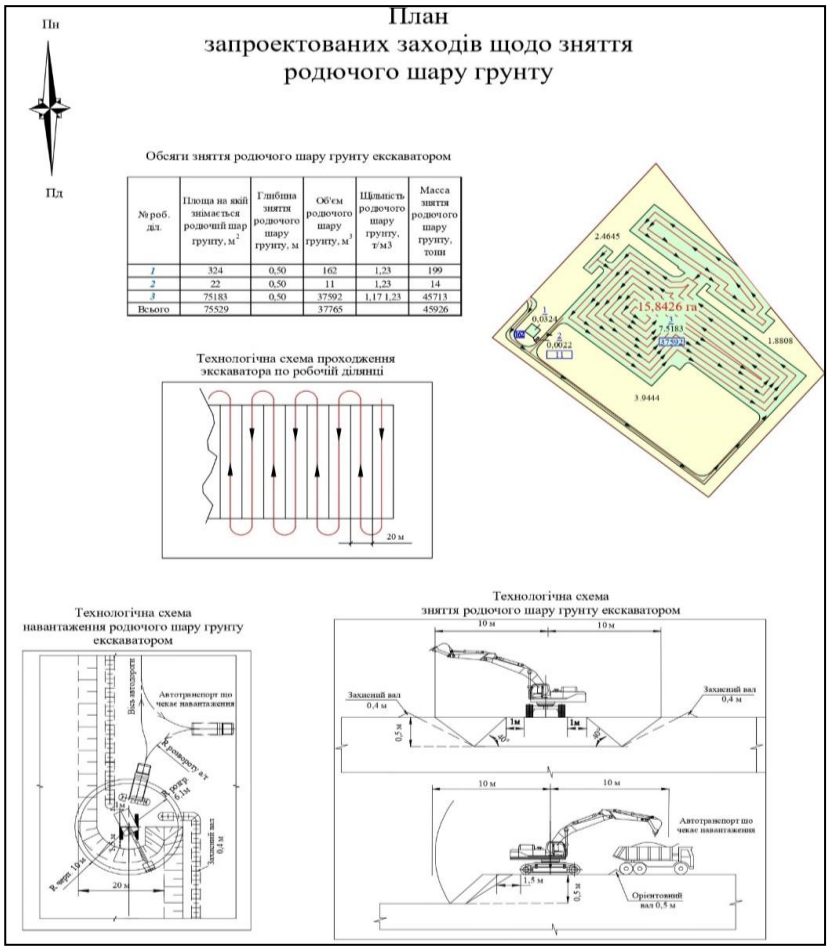


Fig. 2 - Sample drawing of the designed measures for the removal of the fertile soil layer

The objects of application of the fertile layer of soils are unproductive lands. Unproductive lands are transferred to the state of reclamation preparation during the works on application of the fertile soil layer and before the first harvest, and after grounding they should be used mainly for agricultural lands: arable land, cultivated hayfields and pastures, perennial orchards.

The technology of applying the fertile layer of soil should be designed based on the minimum passage of transport and planning machines in order to minimize the sealing effect on the soil.

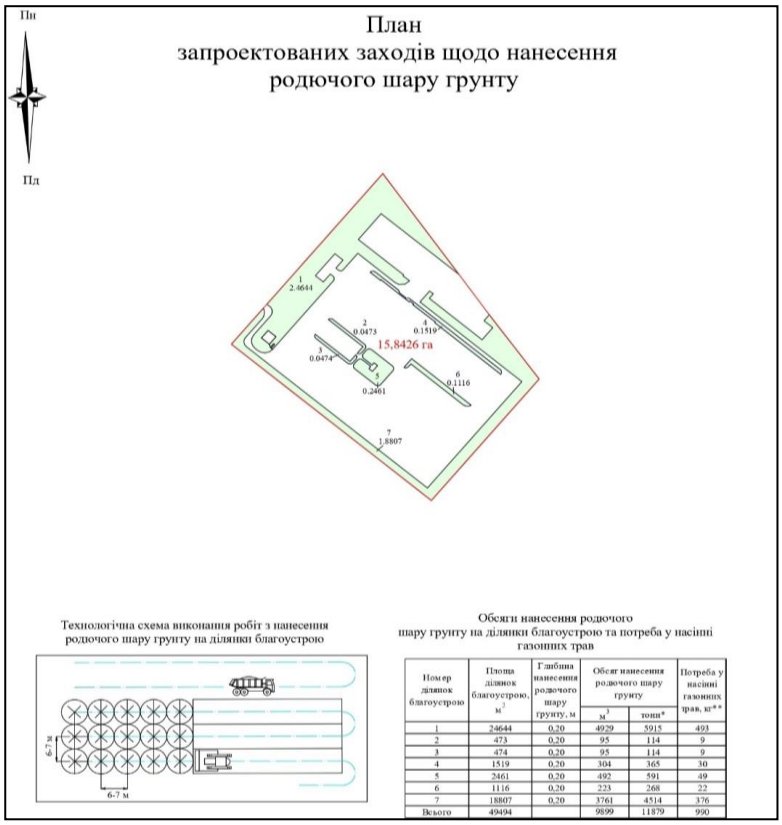


Fig. 3 - Sample drawing of the designed measures for the application of a fertile soil layer

Grounding should be designed taking into account: preliminary implementation of cultural and reclamation works and primary tillage; volumes of the removed fertile layer of soil; assessment of the suitability of the fertile soil layer by its properties; availability and location of plots that require land and access to transport; norms of application of the fertile soil layer, made taking into account specific conditions, features of the natural zone, cultivated crops and land objects; the need for agrochemical, anti-erosion and reclamation works; natural and economic characteristics of reclaimed lands and areas of their further use. The fertile layer of soil should be applied to unproductive lands in the warm dry period of the year [16].

The fertile layer of soil applied to unproductive lands should have a higher content of humus and nutrients, have a greater degree of base saturation compared to soils or rocks of these lands, and have a loamy, clay or sandy mechanical composition. The use of a fertile layer of soil with a humus content equal to or slightly lower, but not less than 1% in reclamation low-yielding lands is allowed.

The fertile layer of soil applied to unproductive lands must be free of radioactive elements, heavy metals, residues of pesticides and other toxic compounds in concentrations exceeding the maximum allowable concentrations for soils, must not be harmful epidemiologically and must not be contaminated by waste. industry, solid waste, stones, gravel, pebbles, construction debris [16].

Working land management projects for the conservation of degraded and unproductive lands

The purpose of the working project of land management on conservation of degraded and unproductive lands is to determine the types, methods of land conservation, the term of conservation, as well as areas of land use.

Conservation of land should include the cessation of economic use for a specified period and afforestation or afforestation of degraded and unproductive lands, economic use of which is environmentally and economically inefficient, as well as man-made contaminated land, where it is impossible to obtain environmentally friendly products. is dangerous to their health.

Conservation of degraded, unproductive and man-made contaminated agricultural lands is designed in the areas of conservation-rehabilitation or conservation-transformation.

Conservation-rehabilitation of agricultural lands is designed by their involvement or transfer to fallow lands and use as fodder lands for a period of 10 to 20 years with subsequent return to agricultural use.

Conservation-transformation of agricultural lands is designed by transferring them to forage lands or removing lands from agricultural lands with subsequent afforestation or transfer to other non-agricultural lands.

Depending on the main indicators that characterize soil properties and determine the need for land conservation in natural and agricultural areas, conservation areas are designed:

Soils of light granulometric composition (sandy in Polissya, sandy and clayey-sandy in the Forest-Steppe, sandy, clayey-sandy and sandy soils in the Steppe zones,

as well as in the areas of the Left Bank and southern Right Bank Forest-Steppe) are preserved by transformation and extraction .

Soils of heavy granulometric composition (light, medium and heavy clay soils mainly on dense clays, as well as on hard rocks) are preserved by rehabilitation in fallow lands or used as forage lands. After a period of rehabilitation under grass vegetation (5-10 years), they can be selectively returned to previous use, but with less intensity of use (in fodder or soil protection crop rotations).

Skeletal soils (soils on the eluvium of dense rocks, which contain in the root layer of rock fragments) are preserved by irreversible transformation and removed from arable land. They can be left for the period of rehabilitation under grass vegetation (5-10 years), used as pastures and habitats and restoration of natural flora and fauna.

Washed soils (medium, heavily washed and washed soils, outputs of soil-forming and underlying rocks) are preserved: the most disturbed lands with rock outcrops, washed and heavily washed soils are irreversibly transformed and removed from arable lands with) or afforestation; moderately washed soils on difficult slopes with a steepness of more than 4–5 °. subject to transformation into meadow pastures; other areas with moderately washed soils are leached for temporary conservation. After the phytomeliorative period (10-15 years) they can return to the composition of arable land (with the restoration of indicators characteristic of the soil, and with less intensity of use (in fodder or soil protection crop rotations)).

Deflated soils (medium- and strongly deflated soils of different particle size distribution) are preserved by removing agricultural lands and afforestation. Loamy and clay deflated soils are tinned for temporary conservation. Measures to protect the surface from blowing should be designed for the period of phytomeliorative rehabilitation.

Saline soils (saline hydromorphic soils of natural origin) are preserved by transformation into hayfields or renaturalized without human intervention; secondary saline automorphic soils of irrigated lands due to phytomeliorative alkalinization are allocated for temporary conservation with the subsequent possible return to the arable

lands under conditions of lowering the groundwater level below the critical and salinization.

Saline soils (medium and strongly saline hydromorphic and semi-hydromorphic (meadow, swamp, meadow-chernozem) and automorphic (common chernozems, southern chernozems, chernozems on dense clays, dark chestnut and chestnut) soils in and semi-hydromorphic soils or meadow and pasture use and temporary phytomeliorative conservation and rehabilitation of automorphic soils.

Wet and swampy soils (sod-podzolic and sod high-gley soils, mineral and organogenic wetland soils of natural origin in Polissya and Forest-Steppe zones) are preserved by natural renaturalization-regeneration; anthropogenically secondary flooded soils in steppe zones in irrigated areas are preserved by transformation into open wetlands. Soils of the natural hydromorphic series of irrigated areas are renaturalized by transformation into open lands. Anthropogenically flooded soils of the automorphic series are allotted for temporary conservation due to siltation.

Swamp organogenic shallow and mineral drained soils are preserved by transformation into haylage.

Working land management projects for the improvement of agricultural and forestry lands

The purpose of the working land management project to improve agricultural and forestry lands may be to improve low-yielding lands by applying a fertile layer of soil, cultivating green manure crops, radical and surface improvement of hayfields and pastures, introduction of uncultivated tillage, application of microbiological preparations, plant growth regulators, microfertilizers, peat and peat composts, sapropel, lake and river silt, chemical reclamation of soils (liming, plastering) and other measures to preserve and improve soil fertility, uprooting decommissioned perennials.

The working project on the improvement of agricultural and forestry lands may include measures to:

- organization of the territory of the fields with the allocation of working and technological plots, providing differentiated tillage and the introduction of advanced

technologies of crop cultivation, taking into account the characteristics of each land plot;

- determination of optimal directions of tillage;

- placement of crops on the working areas of fields and years of crop rotation;

- norms of fertilization of crops and compliance with the balance of humus in the soil.

Forest reclamation protection of soils from water and wind erosion, and crops from adverse climatic factors is designed by creating a single system of protective forest plantations, which includes: protective strips; strips along irrigation and discharge canals; stock-regulating strips; protective in gardens, vineyards, berries; riparian and coastal strips; plantings along rivers and around reservoirs; strip, curtains and massive plantings in mountainous areas; forest belts on drained lands; planting on ravines, steep slopes on stony soil; rockeries, curtains and massive plantings on the sands; protective and decorative plantings in rural settlements, around farmyards and production centers; planting on reclaimed plots.

Working land management projects for protection of lands from erosion, flooding, waterlogging, secondary salinization, drying, landslides, compaction, acidification, contamination by industrial and other wastes, radioactive and chemical substances

The purpose of the working project of land management to protect land from erosion, flooding, waterlogging, secondary salinization, drying, landslides, compaction, acidification, contamination by industrial and other wastes, radioactive and chemical substances is to develop specific agrotechnical anti-erosion and other soil protection measures. all crops in each field and its working areas for each year of crop rotation in order to increase soil fertility and increase crop yields.

The working project of land management on protection of lands from erosion, flooding, waterlogging, secondary salinization, drying, landslides, consolidation, acidification, pollution by industrial and other wastes, radioactive and chemical substances can provide intrafield organization of the territory of crop rotation and placement of crops; anti-erosion agrotechnical measures; placement of crops on work

plots and crop rotation fields for all years of rotation; soil protection technology of tillage; volumes of anti-erosion agrotechnical measures on agricultural crops and in general on crop rotation for all years of rotation.

Conclusions. Implementation of the proposed approaches to the development of working land management projects at the level of the resolution of the Cabinet of Ministers of Ukraine will ensure compliance with Article 54 of the Law of Ukraine of 22.05.2003 № 858-IV "On Land Management" on normative definition of rules regulate the development and implementation of working land management projects taking into account environmental, economic, social, climatic and other conditions, as well as aimed at ensuring land protection.

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ДО ПИТАННЯ ПРО ПРАВИЛА РОБОЧОГО ПРОЕКТУВАННЯ В ЗЕМЛЕУСТРОЇ

Анотація. *Запропоновано науково-методичні підходи до розроблення робочих проектів землеустрою щодо здійснення заходів з рекультивації порушених земель, зняття та перенесення родючого шару ґрунту, консервації деградованих та малопродуктивних угідь, поліпшення сільськогосподарських і лісогосподарських угідь, захисту земель від ерозії, підтоплення, заболочення, вторинного засолення, висушення, зсувів, ущільнення, закислення, забруднення промисловими та іншими відходами, радіоактивними та хімічними речовинами, розроблено структуру і зміст таких проектів.*

Встановлено, що для відновлення порушених площ земель та запобігання їх шкідливого впливу на природне середовище, потрібно проводити рекультивацію земель, яка складається з комплексу технічних та біологічних заходів, які мають мету створення на порушених площах земель оптимальних культурних ландшафтів з продуктивним ґрунтовим покривом. У процесі рекультивації завжди враховується мотивоване формування ландшафтів та створення відповідного природного середовища, при цьому не завжди ставиться задача відновлення первісного стану природного середовища та видів земельних угідь, але зазвичай досягається гармонічне вирішення багатьох питань екологічного та соціального порядку.

Встановлено комплекс якісних та кількісних показників, параметрів, що регламентують розроблення робочих проектів землеустрою з урахуванням екологічних, економічних, соціальних, природно-кліматичних та інших умов.

Проаналізовані науково-методичні підходи та базові нормативно-правові документи до розроблення робочих проектів землеустрою.

Ключові слова: *рекультивація порушених земель, землювання, робочий проект землеустрою, ґрунтовий покрив, родючий шар ґрунту*.

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К ВОПРОСУ О ПРАВИЛАХ РАБОЧЕГО ПРОЕКТИРОВАНИЯ В ЗЕМЛЕУСТРОЙСТВЕ

Аннотация. *Предложено научно-методические подходы к разработке рабочих проектов землеустройства относительно осуществления мероприятий по рекультивации нарушенных земель, снятие и перенесение плодородного слоя почвы, консервации деградированных и малопродуктивных угодий, улучшение сельскохозяйственных и лесохозяйственных угодий, защиты земель от эрозии, подтопления, заболачивания, вторичного засоления, иссушения , оползней, уплотнения, закисления, загрязнения промышленными и другими отходами, радиоактивными и химическими веществами, разработана структура и содержание таких проектов.*

Установлено, что для восстановления нарушенных площадей земель и предотвращения их вредного воздействия на природную среду, нужно проводить рекультивацию земель, которая состоит из комплекса технических и биологических мероприятий, которые имеют цель создания на нарушенных площадях земель оптимальных культурных ландшафтов с продуктивным почвенным покровом. В процессе рекультивации всегда учитывается мотивированное формирования ландшафтов и создание соответствующего природной среды, при этом не всегда ставится задача восстановления первоначального состояния природной среды и видов земельных угодий, но

обычно достигается гармоничное решение многих вопросов экологического и социального порядка.

Установлено комплекс качественных и количественных показателей, параметров, регламентирующих разработку рабочих проектов землеустройства с учетом экологических, экономических, социальных, природно-климатических и других условий.

Проанализированы научно-методические подходы и базовые нормативно-правовые документы в разработку рабочих проектов землеустройства.

Ключевые слова: *рекультивация нарушенных земель, землевание, рабочий проект землеустройства, почвенный покров, плодородный слой почвы.*