Existing legislative requirements for the location of dumping sites, dumping practices and monitoring approaches within BSR

"Application of ecosystem principles for the location and management of offshore dumping sites in SE Baltic Region (ECODUMP)"

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December 2014

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1. INTRODUCTION

This report constitutes a part of the project "Application of ecosystem principles for the location and management of offshore dumping sites in SE Baltic Region (ECODUMP)".

Recent activities of ports in South Baltic region require regular maintenance of operational depths in navigational areas and fairways. Development and maintenance of new ports will imply dredging of several millions cubic meters of sediments in coming years. Although different handling methods of dredged materials are already available in Baltic Sea region existing legal regulations of several countries allow to deposit non-contaminated dredged sediments at special dumping sites, located in marine areas. Currently, there are more than 20 offshore dumping sites in the South-Eastern Baltic Sea, which are used for the depositing of dredged material from port areas and navigation channels.

2. INTERNATIONAL LEGAL ASPECTS

The disposal of dredged material is now widely regulated by international and regional conventions with contracting parties being obliged to introduce national legislation that conforms with them. Currently, offshore dumping activities in the Baltic Sea region are regulated by **Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Substances** (London Convention on dumping-LKD, 1972, amended in 1996) and the requirements of the **Convention on the Protection of the Marine Environment of the Baltic Sea area** (HELCOM, 1992) as well as the requirements of the **Guidelines for the disposal of dredged material at sea** (HELCOM, 2007).

2.1 London Convention

The **"Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972" (London Convention)** is one of the first global conventions to protect the marine environment from human activities and has been in force since 1975. Currently, it is the most widely applicable international regulatory instrument, covering the marine waters of the whole world. Its objective is to promote the effective control of all sources of marine pollution and to take all practicable steps to prevent pollution of the sea by dumping of wastes and other matter. Currently, 87 States are Parties to this Convention. The Convention was revised in 1996, when **„London Protocol"** has come into force and prohibited dumping activities, except for several types of waste material, including dredged soils. Parties of the Convention agreed to control dumping by implementing regulatory programmes to assess the need for and potential impact of dumping. Implementation has also resulted in the development of „Specific Guidelines" for particular types of wastes, containing step-by-step procedures for the evaluation of wastes being considered for sea disposal and including also the assessment of potential adverse environmental effects of dumping and selection of the disposal site.

Both the London Convention and Protocol provide the global rules and standards on dumping as called for in Article 210.6 of the UN Convention on the Law of the Sea (1982).

2.2 OSPAR Convention

This regional legislative document (**Oslo and Paris Convention**) regulates international cooperation on environmental protection in the North-East Atlantic and North Sea and is open to countries, which border these sea areas. Work under the Convention is managed by the OSPAR Commission, made up of representatives of the Governments of 15 Contracting Parties and the European Commission, representing the European Union. The key objective of the strategy is the cessation of discharges, emissions and losses of hazardous substances by 2020 with the aim of achieving concentrations in the marine environment close to background values for naturally occuring substances and close to zero for man-made synthetic substances.

2.3 HELCOM Convention

The Helsinki Convention (1992) on the protection of the Marine Environment of the Baltic Sea works to protect the marine environment of the Baltic Sea from all sources of pollution through intergovernmental cooperation between Baltic countries. Within the framework of the Convention dredged materials may, in accordance with Article 11 of the Convention and Annex V, be permitted to be dumped at sea. Article 11 requires Contracting Parties to ensure that no such materials are dumped without permission issued by their appropriate competent authorities. Annex V lists general exemptions from the general prohibition of dumping of waste applicable to the disposal of dredged material: the dumping can be carried out under a prior special permit issued by the appropriate national authority within the area of internal waters and the territorial sea or outside this area after prior consultations in the Commission. Responsibilities of national authorities include: permit issuing; keeping records of the nature, quantities, location, time and method of dumping; collecting information on possible liability.

In 1992 having regard to Article 9 of the Helsinki Convention, which addresses the issue of dumping of dredged spoils, the Commission adopted HELCOM Recommendation 13/1. The document recommends Contracting Parties to follow the „Guidelines for the disposal of dredged spoils“, adopted by the Commission as well as to report on the national implementation of mentioned document.

3. GUIDELINES FOR THE DISPOSAL OF DREDGED MATERIAL AT SEA

All the regional conventions, mentioned earlier are of major importance for sediment management (including sea disposal) as they have set into force dredged material guidelines with the main aim of environmentally sound disposal at marine areas. Following guiding documents were developed:

- Specific Guidelines for Dredged Material Assessment Framework - DMAF (adopted in 2000) and Waste Assessment Guidance (WAG) of the London Convention.
- OSPAR Guidelines for the Management of Dredged Material (adopted in April 2009)
- HELCOM Guidelines for the Disposal of Dredged Material at Sea (adopted in June 2007).

Content of the guidelines are very similar not to say the same. The competence of these guidelines ranges for the coastal and transitional waters due to national implementation. The Technical Annexes of Conventions have as its aim to provide guidance to national regulatory

authorities, operators of dredging vessels and port authorities on how to minimise the effects on the environment of dredging and disposal operations. Careful assessment and planning of dredging operations are necessary to minimise the impacts on marine species and habitats. All these conventions use the Dredged material assessment framework (DMAF) to define whether dredged material is suitable for specific application or should be disposed at sea (Fig. 1).

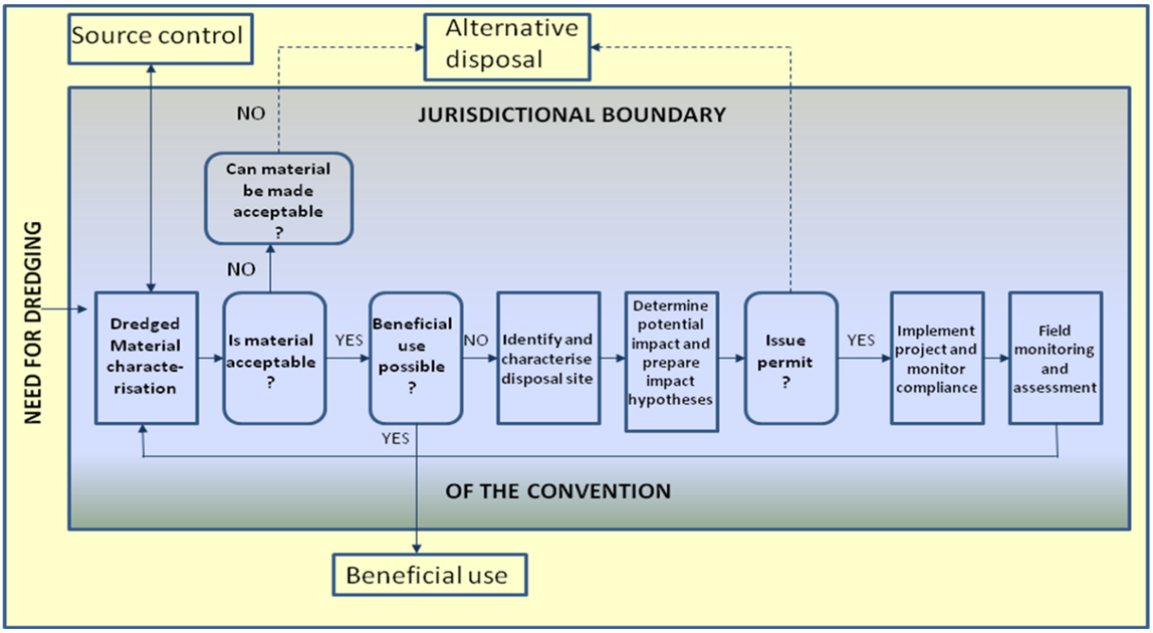

Fig. 1. Structure of Dredged Material Assessment Framework (DMAF)

One of the stages in guidelines application addresses the issues of evaluation of disposal options, selection of sea disposal site, assessment of potential effects and management of the disposal operations. Comparative information is presented below.

Stages	London Convention Specific Guidelines	OSPAR Guidelines	HELCOM Guidelines
Evaluation of disposal options	Dumping means any deliberate disposal at sea of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea. Placement of matter for a purpose other than the mere disposal thereof, provided that such placement the disposal of wastes or other matter directly arising from, or related to the exploration, exploitation and associated off-shore processing of sea-bed mineral resources will not be covered by the	The results of the physical/chemical/biological characterisation will indicate whether the dredged material, in principle, is suitable for disposal at sea. Where sea disposal is identified as an acceptable option, it is nonetheless important, recognising the potential value of dredged material as a resource, to consider the availability of beneficial uses	

	provisions of the LC.	
Sea disposal site selection	Information required to select a **dump-site** shall include: 1. physical, chemical and biological characteristics of the water-column and the seabed; 2. location of amenities, values and other uses of the sea in the area under consideration; 3. assessment of the constituent fluxes associated with dumping in relation to existing fluxes of substances in the marine environment; 4. economic and operational feasibility. Size of the dump-site is an important consideration for the following reasons: • it should be large enough, unless it is an approved dispersion site, to have the bulk of the material remain either within the site limits or within a predicted area of impact after dumping; • it should be large enough to accommodate anticipated volumes of solid waste and/or liquid wastes to be diluted to near background levels before or upon reaching site boundaries; • it should be large enough in relation to anticipated volumes for dumping so that it would serve its function for many years; and • it should not be so large that monitoring would require undue expenditure of time and money.	For the evaluation of a sea **disposal site** information should be obtained and assessed on the following, as appropriate: 1. the physical, chemical and biological characteristics of the seabed (e.g., topography, sediment dynamics and transport, redox status, benthic biota); 2. the physical, chemical and biological characteristics of the water column (e.g., hydrodynamics, dissolved oxygen, pelagic species); 3. proximity to: • areas of natural beauty or significant cultural or historical importance; • areas of specific scientific or biological importance (*e.g.* Marine Protected Areas); • recreational areas; • subsistence, commercial and sport fishing areas; • spawning, recruitment and nursery areas; • migration routes of marine organisms; • shipping lanes; • military exercise zones; • engineering uses of the sea such as undersea cables, pipelines, wind farms only in OSPAR: • past munitions disposal sites; • areas of mineral resources (e.g. sand and gravel extraction areas) Such information can be obtained from existing sources, complemented by field work where necessary.
Assessment of potential	As far as possible, waste management options causing dispersion and dilution of contaminants in the environment	Assessment of potential effects should lead to a concise statement of the expected consequences of the disposal option (*i.e.* the Impact Hypothesis). Its purpose is to provide a basis for deciding whether to

effects	should be avoided and preference given to techniques that prevent the input of the contaminants to the environment.	approve or reject the proposed disposal option and for defining environmental monitoring requirements.	
Management of the disposal operation	Benchmarks (a point on the range of the metric used to identify where environment concern may be low or high for their characteristic) for physical, chemical or biological characteristics can be set based on knowledge of background or ambient conditions in comparable areas that have not been impacted by dumping.	This section deals with management techniques to minimise the physical effects of dredged material disposal. The key to management lies in careful site selection and an assessment of the potential for conflict with other interests and activities. In addition, appropriate methods of dredging and of disposal should be chosen in order to minimise the environmental effects.	
Monitoring	Monitoring is used to verify that permit conditions are met - compliance monitoring - and that the assumptions made during the permit review and site selection process were correct and sufficient to protect the environment and human health - field monitoring. It is essential that such monitoring programmes have clearly defined objectives.	Monitoring in relation to disposal of dredged material is defined as measurements of compliance with permit requirements and of the condition and changes in condition of the receiving area to assess the Impact Hypothesis upon which the issue of a disposal permit was approved.	
Reporting	Contracting Parties should submit Annual Summary of Dumping Permits and Quantities which should include information about type of permit, waste category, total number of permits issued for a waste category, total quantity of a waste category permitted for dumping at sea, ocean dump site location, method of dumping, type of waste dumped at the site.	Together with contaminant data, information on the methods of determination and on quality assurance of analyses of dumped material should be provided as requested in the Reporting Format (Agreement 2009/3). Contracting Parties should also inform the Secretariat of their monitoring activities and submit reports when they are available.	According to 1992 Helsinki Convention Annex V Regulation 3 and Article 11 item 5 the Contracting Parties should report on nature and quantities of material that has been dumped in the Baltic sea area. This should be done according to the reporting format of HELCOM Recommendation 13/1. Contracting Parties should also inform the Secretariat of their monitoring activities and submit reports when they are

			available.

3.1 HELCOM Guidelines for the disposal of dredged material at sea (2007)

These guidelines were adopted by the 21st Meeting of the Heads of Delegation (June 2007) as authorized by the 28th Meeting of the Helsinki Commission (March 2007). Currently these guidelines are the only document providing legally-binding obligations for Baltic Sea countries with regard to authorisation or regulation procedures for dredged material. The guidelines in particular address the disposal of dredged material by dumping in the maritime area and the relocation of sediments, due to hydrodynamic and sidecast dredging as well as its subsequent deposition.

Document was designed to assist Contracting Parties in the management of dredged material in ways that will prevent and eliminate pollution in accordance with Article 3 to the 1992 Helsinki Convention, and protect marine species and habitats in the Baltic Sea Area in accordance with Article 15. Countries are encouraged to apply Best Environmental Practice (BEP) in order to control both dredging and dumping operations. The stages in the application of guidelines include:

- evaluation of need for dredging and disposal
- dredged material characterisation
- evaluation and control of contaminant sources
- sampling of dredged material (for permit issuing)
- evaluation of disposal options
- ***sea disposal site selection***
- assessment of potential effects
- permit issuing
- monitoring and reporting

For the **selection of sea disposal site** guidelines recommend to consider environmental nature and also economic and operational feasibility. Site selection should try to ensure that the disposal of dredged material does not interfere with, or devalue, legitimate commercial and economic uses of the marine environment nor produce undesirable effects on vulnerable marine ecosystems.

Evaluation of a sea disposal site should include following information:

- physical, chemical and biological characteristics of the seabed (topography, redox status, benthic biota)
- physical, chemical and biological characteristics of the water column (hydrodynamics, dissolved oxygen, pelagic species)
- proximity to:

- areas of natural beauty or significant cultural or historical importance;
- areas of specific scientific or biological importance;
- recreational areas;

- subsistence, commercial and sport fishing areas;
- spawning, recruitment and nursery areas;
- migration routes of marine organisms;
- shipping lanes;
- military exercise zones;
- engineering uses of the sea such as undersea cables, pipelines, etc.

The information is obtained from the existing sources, complemented by field work where necessary. Among the main environmental characteristics of the offshore disposal site guidelines also recommend to consider proposed method of dumping, potential future uses of resources and amenities in the marine receiving area, information from baseline and monitoring studies at already established dumping sites. It is also mentioned, that the dredged material which is acceptable for sea disposal and the sediments at the disposal site, or in case of a dispersive disposal site of the the receiving area, should be similar as far as possible, however **there are no clear criterias how this similarity should be evaluated.**

Recently the Guidelines were revised by the HELCOM Environmental Committee. Amended version of the document is divided into two parts: PART A – dealing with the assessment and management of dredged spoil disposal; PART B – providing guidance on the design and conduct of monitoring of marine and estuarine dumping sites.

Location, depth, distance from the coast as well as location in relation to areas of special interest (amenity areas, spawning, nursery and fishing areas, etc.) are mentioned among the main dumping site selection criteria. Revised Guidelines also recommend to consider *method of disposal* (e.g. hopper discharge, discharge through pipes), evaluate *dispersal characteristics* (e.g. effects of currents and wind, horizontal transport and vertical mixing) of dumping area by obtaining data on:

- water depths (maximum, minimum, mean);
- water stratification in various seasons and weather conditions (depth and seasonal variation of pycnocline);
- tidal period, orientation of tidal ellipse, velocities of minor and major axis;
- mean surface drift (net): direction, velocity;
- mean bottom drift (net): direction, velocity;
- storm (wave) induced bottom currents (velocities);
- wind and wave characteristics, average number of storm days per year;
- concentration and composition of suspended solids;

The basic assessment of a dumping site should also include evaluation of the existing stress on biological communities, possible future uses of the sea area and possible effects on amenities (e.g. floating of stranded material, turbidity, objectionable odour, discolouration and foaming).

In selecting disposal sites, the habitats of rare, vulnerable or endangered species should be avoided.

Shortcoming 1:

HELCOM guidelines mainly focuses on what should be investigated when selecting the disposal site, however lacks detailed guiding principles of dumping site location and its further management (monitoring approaches).

Shortcoming 2:

HELCOM guidelines mainly address dumping impact on marine environment, but do not cover sediment transport patterns, which is especially sensitive issue for the south-eastern part of the Baltic Sea, currently suffering from the lack of sediments participating in natural sediment exchange processes.

There is an urgent need to develop comprehensive guiding tools for the location and further management of dumping sites including their monitoring strategy, which could be used as a decision support tool among relevant organizations.

4. EXISTING DUMPING PRACTICES IN THE SOUTH-EASTERN BALTIC SEA AREA

4.1 LITHUANIA

4.1.1 Existing legislative documents regulating dumping procedures

According to the ***Law of Marine environment protection*** (No. VIII-512, 1997-11-13) dumping of dredged material in territorial and internal waters is allowed only by the special permission of Lithuanian Ministry of Environment. The procedures for permit issuing should be approved by the Lithuanian Minister of Environment.

The first provisional regulation on dredged sediments disposal in Lithuanian territorial waters of Baltic Sea was approved in 1994 by the Order Nr. 54 of the Minister of Environment. Further obligations were implemented by developing new procedures for dredging of sediments from the sea and harbour areas including further management. The procedures were presented in the environmental normative document ***LAND 46-2002**: **Regulations on sediments dredging in sea and harbour areas and management of dredged sediments***, approved by the Order Nr. 77 of the Minister of Environment. The document was amended several times (11th of April, 2002; 14th of July, 2003; 26th of November, 2008) due to the changing requirements on European level. In 2011 April new edition of regulations (LAND 46A-2002) was approved by the Order. Nr. D1-286 of the Lithuanian Minister of Environment. New edition specified management procedures by introducing new restrictions for sea disposal according to sediments contamination level. Thus, possibilities of sediments depositing at sea were noticeably limited, while need for new management alternatives increased considerably.

Currently LAND 46A-2002 is the main Lithuanian legislative document regulating the process of soil dredging in port areas and its further disposal, including the permitting procedures relevant to the process. The document is obligatory for port authorities and other institutions, participating in soil dredging and management processes, Ministry of Environment, Regional environmental protection departments and other state authorities.

4.1.2 National authorities involved in the process and their functions

Lithuanian Ministry of Environment - authority, responsible for the developing of environmental policy and coordinating its implementation.

Lithuanian Environmental protection agency (EPA) - issues the permit for dredged soil disposal, organizes the process of environmental impact assessment screening for the establishment of new marine dumping site and make the final decision.

Marine research department - organising, coordinating and implementing the complex Baltic Sea monitoring, involved into the implementation of HELCOM activities.

4.1.3 Principles of dumping site location

There are no officially approved procedures for the location of dumping areas in Lithuanian legislation. Environmental normative document LAND 46A-2002 indicates, that for the establishment of new marine dumping site the process of environmental impact assessment (EIA) screening should be completed and officially approved by the Lithuanian EPA. New dumping area can be operated upon the approval.

4.1.4 Permitting procedures for soil dredging and dumping at sea

The LAND 46A-2002 document defines the permission procedures for the dredging and further disposal of sediments in accordance with the requirements of the Helsinki Convention. The permit for dredging and disposal of sediments is issued by the Lithuanian EPA after the detailed evaluation of sediments amount, characteristics, concentration of hazardous substances, work period as well as environmental conditions during the sediment dredging and management processes. In order to get the permit for dredging and dumping of sediments the contractor should provide relevant information to EPA for further evaluation. The information, which is needed for permit application is presented in a table below (Table 1).

Table 1. The legal procedure for the sediment dredging and dumping permit in Lithuania

Type of information	Specification
General information	Information about contractor, type of dredging (maintenance, clean-up, capital), planned duration of dredging works, aim of dredging, way of dredging
Dredging area	Map of the area with coordinates
Data on soil to be dredged	- planned amount of sediments to be dredged (m^3)
Data on further management of dredged soil	Beneficial use Sea disposal Temporary storage or disposal on land
Other information	In case of sea disposal option: - map of dumping area with coordinates - amount of sediments to be dumped in particular location - succession of location changing

Before applying for the permit the approval from the environmental protection agency on possibility to use the offshore dumping site needed. The permit is issued (or not) during the 10 working days after the application submission to EPA, or during the 20 working days if permit issuing procedure needs to be additionally agreed with the Ministry of Environment. The permit is issued for the period of 18 months and if needed can be extended for additional 6 months in case there is sufficient amount of information indicating the absence of contamination available. The permit can be extended for the period of 2 years.

4.1.5 Possibilities of sea disposal

The possibility of dredged sediments disposal at sea is evaluated based on the results of physical, chemical and biological analysis of sediment samples, taken from the dredging area. Chemical analysis is not obligatory for the sand (amount of fractions < 0.1 mm is not more than 30%).

Dredged sediments are allowed to be dumped at sea if chemical concentrations of pollutants are below particular contamination levels. The level of contamination is determined by the actual concentration of pollutants (mg/kg of dry weight) in comparison with nationally established concentration limits, provided in the table below (Table 2).

Table 2. Classification of sediments by contamination level in Lithuania (LAND 46A-2002)

Contamination level	Type of soil	Concentration limits of pollutants (mg/kg of dry weight)											
		OP	Cu	Pb	Zn	Ni	Cd	Cr	Hg	As	PCB	PAH	TBT
I	Sand	<100	<10	<20	<60	<10	<0.5	<30	<0.1	<3	<0.007	<1.0	<0.01
II	Sand	100-200	10-40	20-50	60-100	10-20	0.5-1	30-50	0.1-0.2	3-5	0.007-0.01	1.0-1.5	0.01
	Mud	<500	<100	<100	<300	<50	<2	<100	<0.5	<10	<0.02	<2.0	0.01
III	Sand	200-1500	40-200	50-200	100-400	20-100	1-5	50-200	0.2-1.2	5-29	0.01-0.03	1.5-3.0	0.01-0.1*
	Mud	500-1500	100-200	100-200	300-400	50-100	2-5	100-200	0.5-1.2	10-29	0.02-0.03	2.0-3.0	0.01-0.1*
IV	Sand/Mud	>1500	>200	>200	>400	>100	>5	>200	>1.2	>29	>0.03	>3.0	>0.1*

*The concentration limit for TBT in dredged sediments from 2018 January 1st will be **0.06 mg/kg of dry weight.**

Clean sandy sediments (**I contamination level**) can be dumped in the near shore zone (< 20 m depth) and also can be used for the beach nourishment purposes if satisfies existing health regulations (according to the results of biological analysis). Slightly contaminated sediments (**II contamination level**) can be dumped only at depths more than 20 meters. The same stands for the sediments of **III level of contamination**, however additional chemical analysis of sediments is required before the disposal. Sediments with the highest level of contamination (**IV contamination level**) are not allowed to be dumped at sea and should be disposed on land.

4.1.6 Dumping procedures

The dredged material should be disposed at sea area, specified in issued permit. In order to ensure the even distribution of dumped material at marine dumping site the maximum load should not exceed 10000 m^3/ha. Following the recommendations of „HELCOM Guidelines for the disposal of dredged material at sea“ the disposal vessels must be equipped with AIS (Automatic Identification System) and GPS (Global positioning system), which should be switched constantly. Executor of disposal works must fill in the journal of disposal process, by recording the time, amount and location of soil disposal. The journals must be stored for at least 3 years after the end of disposal works.

The contractor of the sea disposal works should ensure the environmental monitoring of dumping site and adjacent area, in order to evaluate the impact of dumping activity on marine

environment. As soon as the amount of dumped sediments exceeds 5 mln. m^3 the contractor is obliged to organize the Assimilation capacity assessment procedure for the dumping site. This procedure should be agreed with Lithuanian EPA.

4.1.7 Monitoring of existing marine dumping sites

Currently systemic observations of marine environment are carried only in deep-water dumping site in accordance with National environmental monitoring programme and industry oriented monitoring programme of Klaipėda State Seaport. According to the National monitoring programme state of the environment in dumping site is investigated only in 2 monitoring stations. More detailed matrix of stations provided in Klaipeda port monitoring programme. 5 monitoring stations are located in the dumping area in order to evaluate the impact of dumping activities on state of the water and bottom sediments (Fig. 3). 3 more monitoring stations are distributed along the shore close to the Klaipėda port entrance channel in order to control possible contamination of the nearshore zone from port.

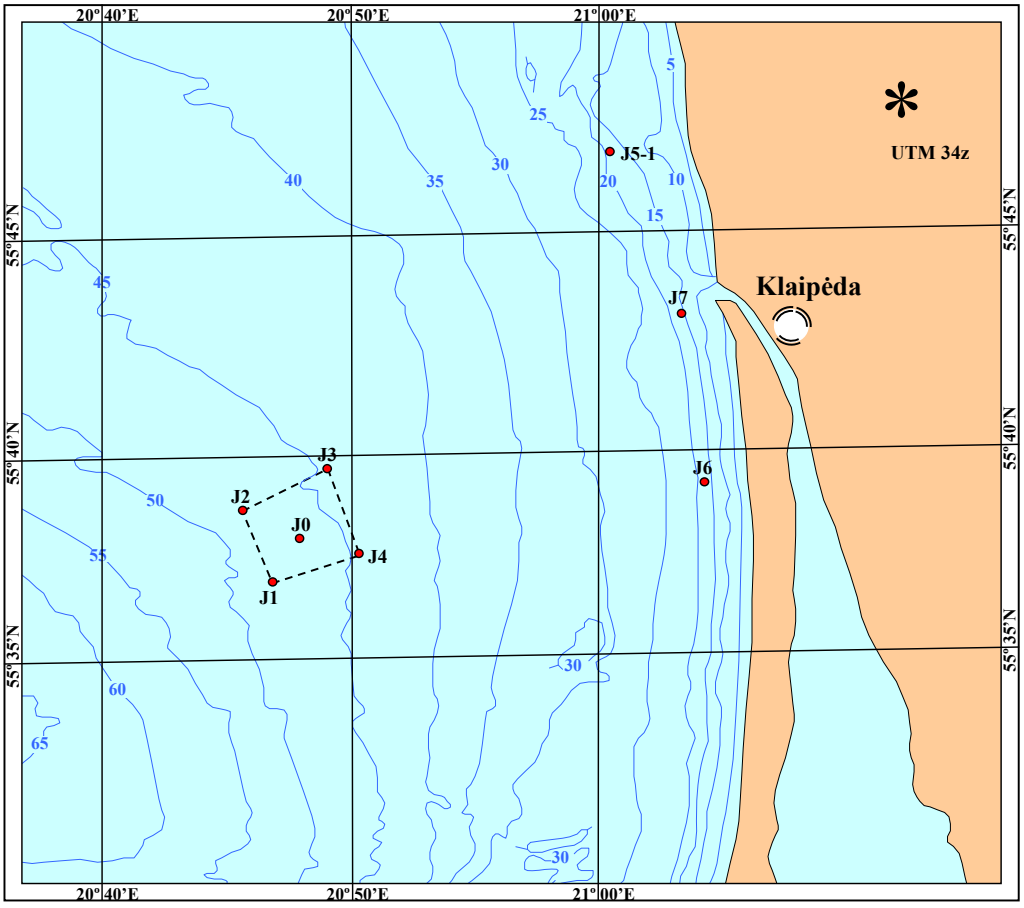

Fig. 3. Monitoring stations at deep-water dumping site in Lithuanian Baltic Sea

Following environmental parameters are regularly observed:

Component	Stations	Observed parameters	Frequency

Water (surface and near bottom horizons)	J0, J1, J2, J3, J4, J5-1, J6, J7	Current velocity and direction Suspended matter (conc.) Temperature Salinity Transparency pH, O_2, PO_4^{3-}, P (total), NH_4^{3+}, N (total), NO_2^-, NO_3^-, chemical oxygen demand (COD), total oxygen demand (TOD), oil products, metals – Cu, Zn, Ni, Pb, Cr, Cd, Hg.	Once per season (4 times/year)
Bottom sediments (0-10 cm surface layer)	J0, J1, J2, J3, J4, J5-1, J6, J7	Grain size composition	2 times/year (spring & autumn)
Bottom sediments (0-10 cm surface layer)	J0, J1, J2, J3, J4, J5-1, J6, J7	Chemical contamination by oil products, heavy metals (Cu, Zn, Ni, Pb, Cr, Cd, Hg)	2 times/year (spring & autumn)
Bottom sediments (0-10 cm surface layer)	J0	α-, γ- heksachlorcikloheksan, DDT, DDD, DDE, heksachlorbenzen, PCBs sum (28, 52, 101, 118, 138, 153, 180), TBT, PAAs sum (anthracene, benz(a)anthracene, benz(ghi)perilene, benz(a)pirene, chrizene, fluoranthene, indeno(1,2,3-cd)pirene, pyrene, fenanthren)	2 times/year (spring & autumn)
Makrozoobenthos	J0, J1, J2, J3, J4, J5-1, J6, J7 (D1, D2, D3, D4, D5, D6, D7)*	Species composition, abundance and biomass	Spring
Fish	2 stations in the dumping site impact zone	Species composition, abundance and biomass	2 times/year (spring & autumn)

Due to the permanent changes of bottom relief as well as grain size and lithological composition of bottom sediments in dumping area additional investigations are carried out. Changes of bottom relief are investigated in 6 profiles, also 12 stations for sediment sampling are distinguished in the dumping area (Fig. 4).

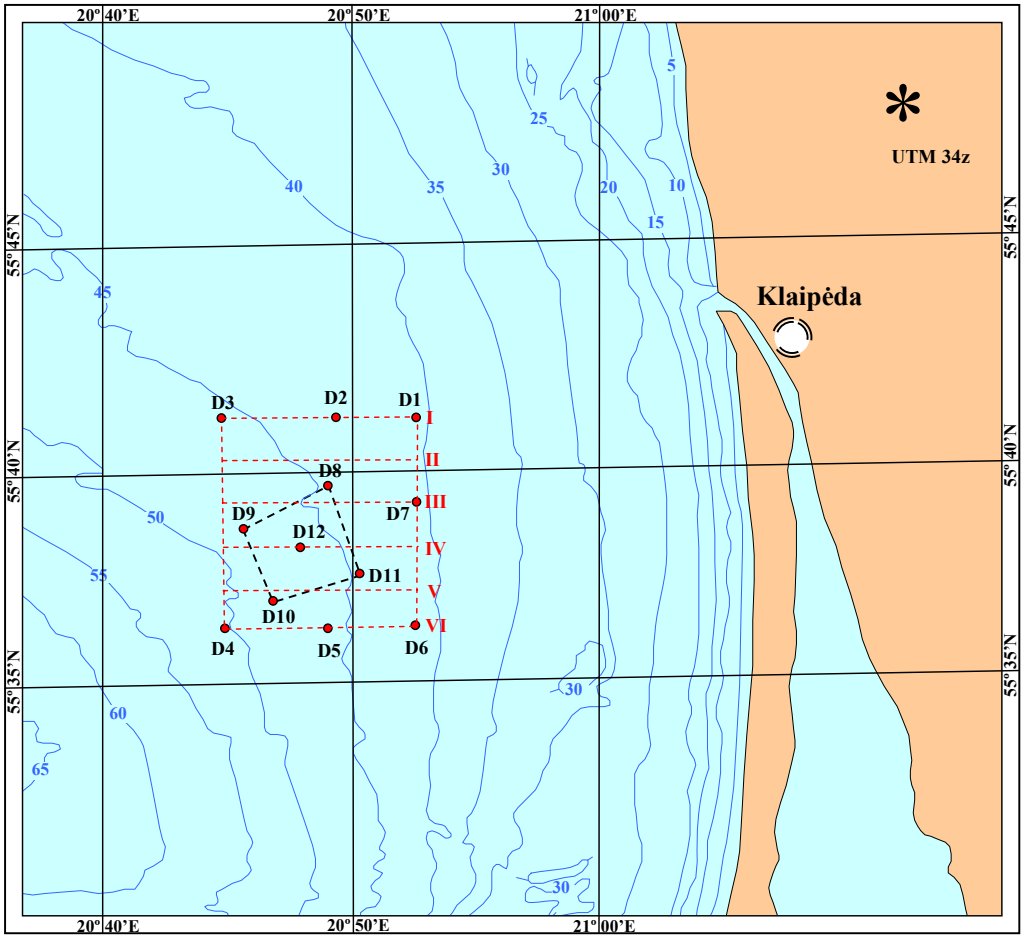

Fig. 4 Echo-sounding profiles and sediment sampling stations at deep-water dumping site

*Once per year (spring) sediment samples from these 12 stations are analysed for the grain size composition as well as abundance, composition and biomass of benthic species.

More detailed investigations of existing dumping sites are carried during the assessment of site assimilation capacity in accordance with the requirements of LAND 46A-2002 normative document. First detailed investigations of deep-water dumping site in Lithuania were initiated already in 1997, later on in 2002 and 2006. Last assessment of both dumping sites was carried out in 2011 by Klaipėda University Coastal research and planning institute (KU CORPI) and included the analysis of hydrological and hydro-chemical state of the dumping area, changes of bottom relief, lithological and geochemical composition of bottom sediments, benthic communities and fish species. According to the results of investigations current state of the dumping areas was evaluated and recommendations for further operation developed. Main conclusions from the last scientific investigations were as follows:

- dumping activities considerably changed the relief of deep-water dumping site with highest bottom altitudes reaching 3-4 meters;
- intensive hydrologic activity in the dumping area stipulates permanent levelling of dumped sediments – descending of the burried humps and climbout of relief in adjacent areas;
- part of the dumped sediments spreading out from the dumping area;
- considerable changes in the lithological composition of dumping area are observed;
- finest sedimentary matter (< 0,1 mm) spreading out from the dumping area;
- contamination of bottom sediments in dumping and adjacent sectors is insignificant;
- impact of dumping activities on benthic communities is fixed only in the dumping area;
- there were no negative changes of fish species abundance identified.

The information about the state of deep water dumping site was summarized during the implementation of the project and is available in the "Report of quantity, types and characteristics of the sediments from existing dumping sites in SE Baltic" (Dembska et al., 2014).

4.2 POLAND

4.2.1 Existing legislative documents regulating dumping procedures

Based on the act of 14 December 2012 on waste (Journal of Laws of 2013, item 21) sediments relocated inside surface waters for the purpose of managing waters and waterways or of preventing floods or mitigating the effects of floods and droughts or land reclamation are excluded from the scope of the act on waste if the sediments are not hazardous.

According to the Regulation of the Polish Minister of Transport and Maritime Economy of 26th of January 2006 ***"On the procedures for issuing permits for discharge into the sea of dredged material and dumping at sea of wastes or other substances"*** (Journal of Laws No. 22, item 166) dumping of dredged material in offshore dumping sites is allowed by the special permission of Maritime Office after collaboration with Regional Directorate for Environmental Protection. The regulation defines permit issuing procedures and regulates process and functions of national authorities involved.

Since 2014, the Regulation of the Minister of Environment of 16th of April 2002 ***"On the types and concentrations of substances causing the contamination of dredged material"*** (Journal of Laws No. 55, item 498) no longer applies due to the repeal of its legal basis and so far no new requirements for dredged material have been adopted. The repealed regulation defined methods of sediment sampling and analysis, including the sampling frequency and number of sampling site for the investigations of trace metals, PCBs and PAHs contamination. The sediment samples were to be taken in dredging areas (fairways, water bodies, natural flows, channels) using the grab at the depth of dredging up to 1 m (0.5 m in wet docks). In case of deep dredging the core samples were to be taken. The regulation defined also possibilities of dredged sediments disposal at sea. In the light of the repeal of the 2002 regulation, new regulations with specific requirements relating to management of dredged material are expected in 2015.

4.2.2 National authorities involved in the process and their functions

Maritime Offices – permit issuing authorities, establishment and management of the offshore dumping sites

Regional Directorate for Environmental Protection – coordinating and approving authority

4.2.3 Principles of dumping site location

There are no officially approved legislative documents on the location of marine dumping sites in Poland, however general principles, stated in earlier mentioned global and regional conventions, are applied when selecting the area for sea disposal. Those are:

- dumping site should be located at appropriate distance from the port;
- lithological composition of the dumping site sea bottom should correspond to the lithological types of dredged sediments;
- the suspension and organic matter should affect only the local environmental processes in the water and living conditions of the pelagic organisms;
- dumping site should be located at possible safe distance from the main fairways in order to ensure the safety of navigation

4.2.4 Permitting procedures for sediment dredging and dumping at sea

The procedures of sediment dredging and further dumping at sea are described in the Regulation of the Polish Minister of Transport and Maritime Economy of 26th of January 2006 (Journal of Laws No. 22, item 166). The permits for sea disposal are issued by Maritime Offices, administrating the area of dumping site location after the positive evaluation of the Voivod or Regional Directorate for Environmental Protection.

The permitting procedure is arranged by the port authorities and further implemented by contractors (dredging companies), which submit permit application to responsible environmental authority. Permit application includes following information:

- The amount of dredged sediments;
- Results of chemical analysis of bottom sediments and contamination levels;
- Location of sea disposal area with geographical coordinates;
- Environmental Impact Assessment of dredged sediment dumping in the sea;
- Conclusion of Voivod or Regional Directorate for Environmental Protection

4.2.5 Possibilities of sea disposal

Dredged sediments are allowed to be dumped at sea if chemical concentrations of pollutants are below particular contamination levels. The level of contamination is determined by the actual concentration of pollutants (mg/kg of dry weight) in comparison to nationally established concentration limits, provided in the table below (Table 4).

Table 4. Concentration limits of pollutants in bottom sediment

No	Substance	Concentration limits [mg kg^{-1}d.w.]
Trace metals		
1	As	30
2	Cr	200
3	Zn	1000
4	Cd	7,5

5	Cu	150
6	Ni	75
7	Pb	200
8	Hg	1
Polycyclic Aromatic Hydrocarbons (PAH)		
9	Benzo(a)antracene	1,5
10	Benzo(b)fluoranthene	1,5
11	Benzo(k)fluoranthene	1,5
12	Benzo(ghi)perylene	1,0
13	Benzo(a)pyrene	1,0
14	Dibenzo(a,h)anthracene	1,0
15	Indeno(1,2,3-c,d)pyrene	1,0
Polychlorinated biphenyls (PCBs)		
16	the sum of 7 PCB congeners: 28, 52, 101, 118, 138, 153 and 180	0,3

Dredged sediments cannot be dumped at sea if chemical concentrations of pollutants exceed officially approved (Regulation of the Polish Minister of Environment of 16 April 2002 (Journal of Laws No. 55, item 498)) concentration limits. It is important to mention that in this regulation sediments are not classified by the grain size.

Since 2013, in the absence of more specific requirements relating to the management of dredged material, two major approaches have been developed to assess dredged material and its suitability for dumping. Reference can either be made to dredged material characteristics, including chemical content and concentration equivalent to pre-2013 levels as given in Table 4 or to the levels derived from the waste legislation. In any case, however, dumping strictly complies with the **HELCOM Guidelines for the disposal of dredged material at sea.**

4.2.6 Dumping procedures

Dumping of dredged sediments is possible only after the permit issuing procedure. Following the recommendations of "HELCOM Guidelines for the disposal of dredged material at sea" vessels must be equipped with AIS (Automatic Identification System) and GPS (Global Positioning System), which should be switched constantly. After the end of disposal operation contactor informs Maritime Office.

4.2.7 Monitoring of existing marine dumping sites

Systematic observations of marine environment in existing dumping sites of Poland are not carried out. Periodic scientific investigations of Gdańsk and Gdynia Dumping Sites were conducted by the Maritime Institute in Gdańsk in 2008 - 2010 and included geophysical and chemical analysis. Since 2013, two dumping sites in the area of Szczecin –Świnoujście were monitored. The investigations have included physical, chemical and biological components.

More detailed investigations (bathymetric measurements, sediment and water sampling, laboratory analysis) were also arranged during the implementation of the ECODUMP project. In addition to the above activities, systematic monitoring on compliance with the terms of permit for dumping (Section 4.6 Dumping procedures) is conducted in Poland. It is done by registration of dredging barges in the system or electronic monitoring maritime traffic SWIBZ, based on AIS information - it gives the possibility to verify the ship traffic (even a few years ago).

4.3 RUSSIA (KALININGRAD REGION)

4.3.1 Existing legislative documents regulating dumping procedures

Dumping of dredged material in the exclusive economic zone of the Russian Federation Baltic Sea is carried out in accordance with national legislation and requirements of regional documents (London Convention and Protocol, HELCOM Convention).

The main legislative documents of the Russian Federation, regulating the process of sediment dredging and further dumping at sea, including the procedure of authorization, are:

1. Federal Law "On Environmental Protection", 10.01.2002, № 7-F3;
2. Federal Law "On the continental shelf of the Russian Federation", 25.10.1995, № 187-F3 (amended on 09.05.2005);
3. Federal Law "Waste production and consumption", 24.06.1998, № 89-F3;
4. Federal Law "On the inland waters, territorial sea and contiguous zone of the Russian Federation", 31.07.1998, № 155-F3 (last amended on 07.05.2013);
5. Federal Law "On the exclusive economic zone of the Russian Federation", 17.12.1998, № 191-F3;
6. Federal Law "On the Ecological Expertise", 23.11.1995, № 174-F3.

In 1996 the regional normative document “Standards and criterions for the evaluation of sediments contamination in water areas of St. Petersburg” was developed. Development of standards was based on the recommendations of Environmental protection Agency of Netherlands, Centre of Soil Investigations and HASKONING enterprises in cooperation with Environmental protection Agency of Netherlands during the implementation of PSO 95/RF/3/1 programme „Dredging and disposal of sediments in St. Petersburg“.

Although the document is of temporal character and applies to the extraction and further use of sediments (land creation, disposal at sea, disposal on land), dredged from water areas during the maintenance dredging activities in Sankt-Petersburg region, it could be useful and applicable also in other areas.

4.3.2 National authorities involved in the process and their functions

State Committee of the Russian Federation for Environmental Protection – the federal executive body authorized: to implement state environmental monitoring in the inland waters and territorial sea; issue permits for the dumping of dredged sediments.

Ministry of natural resources and ecology of the Russian Federation – ecological expertise organizing and decision making authority.

4.3.3 Principles of dumping site location

The are no officially approved procedures for the location of new dumping areas. However, the amended Federal Law "On the inland waters, territorial sea and contiguous zone of the Russian Federation" stresses that offshore dumping areas cannot be located within the boundaries of protected areas including their buffer zones as well as within the boundaries of fishery conservation areas of the inland waters or territorial sea.

4.3.4 Permitting procedures for soil dredging and dumping at sea

Dumping of dredged sediments in the continental shelf and exclusive economic zone of the Russian Federation is allowed only with a special permission of the State Committee of the Russian Federation for environmental protection (Application № 110 from 18.03.1999). The permit is given on case-by-case basis, with no common expiration term. In case of violation of the conditions stipulated in the permit it can be withdrawn from the contractor before the date of expiry.

In order to get the permit for soil dumping the contractor need to make direct inquiry to the State Committee of the Russian Federation for Environmental Protection. The inquiry should contain following basic information:

- Information about the contractor;
- Characteristics of the sediments (total amount, state and properties, contamination, stability, accumulation and biotransformation properties, tendency to interact with other substances, possibilities of color changing);
- Geographic coordinates of the dredging area;
- Information about the dumping site and dumping method (geographic coordinates, depth, distance from the shore, dumping frequency, important areas nearby, initial dilution, spreading characteristics, water characteristics, sea bottom characteristics, availability and effects of previous dumping procedures on site);
- General conditions of dumping (possible impact on the recreational areas (turbidity, odor, discoloration and foaming), impact on marine environment including fisheries, impact on the other sea uses, availability of sediment management possibilities on land, planned dumping periods, type of dumping techniques and methods);
- Monitoring program of dumping areas and environmental conditions during the dumping activities.

Permit application should be also approved by following authorities:

- Federal executive body responsible for the national defense (possible threat to the national defence);
- Federal executive body responsible for the public services and management of the state property in the area of sea and river transport (possible threat to maritime safety);
- Federal executive body responsible for the fisheries (dumping site location in relation to fishery conservation areas).

Additionally to the permit application the contractor should also provide positive conclusion of state environmental review, which is conducted in accordance with Federal Law "On Ecological Expertise". The expertise is organized by the Ministry of Natural Resources and Ecology of the Russian Federation. In case of negative conclusion project cannot be implemented and should be amended in accordance with the remarks, provided by experts.

The permit is issued not later than after 8 months, including the time needed for the National Ecological Expertise and can be extended for additional 30 days in case there are remarks from authorities, participating in the permit issuing procedures.

The permit for the offshore disposal is not issued, if:

- Positive conclusion of state environmental review is not available;
- There is no decision to grant a water body use for certain areas of internal waters and territorial sea;
- Possibilities of the offshore disposal are not approved by the authorities, responsible for state defence, public services and management of sea and river transport, fisheries.
- Permit application procedure is incorrect.

4.3.5 Possibilities of sea disposal

According to the Article Nr. 37 of the Federal Law "On the inland waters, territorial sea and contiguous zone of the Russian Federation" sea disposal of dredged sediments cannot be implemented in the areas of nature protection and fishery conservation. Sea disposal is also prohibited if dredged sediments contain hazardous substances, mentioned in the international agreements and national legal documents.

The list of hazardous substances is currently available in the temporal regional normative document “Standards and criterions for the evaluation of sediments contamination in water areas of St. Petersburg”. Dredged sediments are classified by 5 contamination classes. Contamination level is determined by the actual concentration of hazardous substances (mg/kg of dry weight of sediment) in comparison to nationally established concentration limits. If measured concentrations of particular substances are higher than the available concentration limits, presented in below table, sediment cannot be dumped at sea (Table 6).

Table 6. Limit values for the pollutants in sediments

Substance	Concentration limit (mg/kg d.w.)
Trace elements	
Arsenic (As)	29
Cadmium (Cd)	4

Chromium (Cr)	120
Copper (Cu)	60
Mercury (Hg)	1.2
Lead (Pb)	110
Nickel (Ni)	45
Zinc (Zn)	365
Oil products	1500
Sum of 7 PCBs	0.03
Sum of chloroorganic pesticides	0.03
Aldrin	0.0025
Dieldrin	0.0005
Endrin	0.001
DDT (incl. DDD and DDE)	0.0025
α-endosulfan	0.0025
α-HCH	0.0025
β-HCH	0.001
γ-HCH	0.00005
Polyaromatic hydrocarbons (PAHs)	
Naphtalene	0.8
Phenantrene	1
Anthracene	0.8
Fluoranthene	2.3
Chrisene	1
Benzo(a)anthracene	1
Benzo(a)pyrene	0.9
Benzo(k)fluoranthene	0.8
Indeno(1,2,3)pyrene	0.8
Benzo(g,h,i)perylene	0.8
Indeno(1,2,3)pyrene	0.8
Benzo(g,h,i)perylene	0.8

4.3.6 Dumping procedures

Dumping of dredged sediments is possible only after the permit issuing procedure, which is discussed in 4.3.4 chapter.

4.3.7 Monitoring of existing marine dumping sites

According to the Article Nr. 36 of the Federal Law "On the inland waters, territorial sea and contiguous zone of the Russian Federation" State environmental monitoring of the inland sea waters and territorial sea forming a part of the state ecological monitoring (State Environmental Monitoring), is a system of regular observations of marine environment and sediment physical, chemical, hydrobiological and microbiological parameters as well as predicting of their changes under the influence of natural and anthropogenic factors.

State monitoring is carried out by federal executive bodies authorized by the Government of Russian Federation with the participation of executive bodies in accordance with the laws of Russian Federation.

Regular observations of the marine environment at the dumping sites are carried only during the execution of dredging works. The state of water in dumping site is observed in 4 monitoring stations (Fig. 7) once a month (2 horizons) and includes the analysis of following parameters: suspended matter, temperature, salinity, transparency, pH, O_2, P (total), N (total), oil products, metals – Cu, Zn, Ni, Pb, Cr, Cd, Hg.