



PIANC

The World Association for Waterborne
Transport Infrastructure

Environmental Commission
EnviCom WG 274

A PRACTICAL GUIDE FOR APPLYING THIN LAYER PLACEMENT APPROACHES FOR SUSTAINABLE WATER TRANSPORT INFRASTRUCTURE

PROPOSED TECHNICAL WORKING GROUP TERMS OF REFERENCE

1. Historical Background Definition of the problem

Billions of cubic meters of material are dredged annually to maintain safe and reliable navigation or for port and offshore structure foundations. Historically, dredged material was disposed of in dedicated marine or inland facilities. More recently, requirements are changing to maximize benefits and minimize environmental impact on disposal sites.

This report addresses thin layer placement (TLP) as a dredged material management strategy to increase the beneficial use or reduce environmental impact of dredged material. Thin layer placement is controlled placement of dredged material in deci- to centimeter layers of thickness. In this manner, TLP has several advantages:

- Application on ecologically sensitive seabed and wetland areas, as thin layers can limit harm to the environment and allow benthos and other species to recolonize in a short time.
- Raise sediment bed elevations in sediment starved areas, particularly intertidal- and nearshore areas and may be utilised to support translocation of sediment of adjacent areas.
- Remediate contaminated seabed areas to reduce risk to people and the environment.
- Create engineered features overlaying contaminated materials in disposal areas.
- Enhance economic, environmental, and social value to areas where it is applied.
- Allows for exemptions from regulatory approvals, permits or licensing pertaining to dumping dredged materials as a 'waste'.
- Support enhancement of degraded areas (e.g., sediments dredged from seagrass beds).
- Create stable working platforms in (port reclamation) projects in combination with ground improvement techniques where predominantly unsuitable materials is present.

2. Objective

The objective of the proposed WG is to provide technical information and guidance regarding the state of the practice and requirements for use of TLP applications, design, and technologies, analysing relevant case studies and best practices worldwide.

The report will link to other relevant reports published by PIANC, CEDA, and IADC and USACE, among others. The report will address TLP as a sediment management practice, including regulatory and permitting issues.

The report will provide guidance for users to apply TLP that will serve as a sustainable dredged material management alternative for waterborne transport infrastructure projects.

3. Earlier reports to be reviewed

Relevant PIANC EnviCom and PTGCC reports include:

- PIANC EnviCom WG 19 Beneficial Uses of Dredged Material: A Practical Guide (1992)
- PIANC EnviCom WG 104 Dredged Material as a Resource (2009)
- PIANC EnviCom WG 176 Working with Nature (2018)
- PIANC PTGCC WG 178 Climate Change Adaptation (2020)
- PIANC EnviCom WG 195 Ecosystem Services (2022)
- PIANC EnviCom WG 214 Beneficial Use of Dredged Material (2023)
- PIANC EnviCom WG 267 Biodiversity in Navigation Infrastructure projects (ongoing)

Third-party reports and other published or unpublished sources of information include:

- USACE (2023) Thin-layer Placement Guidelines

4. Scope of work

The WG will demonstrate how to evaluate TLP as a beneficial use practice within regulatory frameworks and provide guidance on how to apply TLP:

- Definition of TLP in practice and its marine and land-based application.
- Historical and current trends as well as lessons learned from previous practice.
- Material suitability according to the specific case including contaminated sediments, geotechnical features and others, for example, materials containing viable seedbanks (e.g., from seagrass beds).
- Role of TLP in the sustainable management of dredged material and contribution to a life-cycle approach towards sediment management and achievement of project benefits.
- Specific difficulties of applying TLP both in shallow and deepwater.
- Best available technologies according to the aim of the project, including potential limitations of turbidity.
- Practical guidance and solutions to overcome impediments of applying TLP.
- Evaluate the costs of TLP relative to other placement and disposal options.
- Monitoring of the results.
- Address sustainability, resilience, climate change, and collaborative processes
- Analysis of case studies of successful TLP applications in practice.
- Strengths and limitations of the technique.
- Provide guidance around best practice TLP monitoring regimens.



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5. Intended product

The working group report will provide guidance to environmental specialists, engineers, designers, project owners, contractors, decision-makers and permitting authorities about TLP.

6. Working Group membership

WG membership should include:

- Ecologists/biologists
- Scientists/academics
- Coastal, water, offshore and wetland engineers/geomorphologists
- Administrations related with sediment management
- Regulators and permitting authorities
- Port and Waterway Authorities, planners and engineers
- Project owners (public and private)
- Contractors and dredging companies
- Consultants and sediment management, geotechnical & environmental experts

7. Target audience

The target audience of the report covers the same specialities listed for membership:

- Port and waterway Authorities
- Scientists and engineers
- Government and regulators
- Contractors and dredging companies
- Decision-makers

8. Relevance

8.1. Relevance to countries in transition, etc.

The report will be relevant to all countries, being particularly useful to countries in transition regarding future trends.

8.2. Climate Change and Adaptation

Thin layer placement techniques have the potential to use dredged material more effectively and sustainably compared to other placement and disposal methods for specific problems. Cost associated with TLP will be discussed to improve understanding of the potential benefits to mitigate aspects of climate change.

8.3. Working with Nature

The placement of dredged material in thin layers can serve as a key tool for WwN initiatives, notably in terms of the restoration and ecosystem service functions it provides and hence offer relevant environmental and other co-benefits.



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8.4. UN Sustainable Development Goals

The WG report would contribute to the achievement of multiple UN Sustainable Development Goals, notably:

- 13 (Climate action)
- 14 (Life below water)
- 15 (Life on land)

whilst also supporting:

- 9 (Infrastructure, innovation, industry)
- 3 (Good health and wellbeing)

9. References

Piercy, C., T. Welp, and R. Mohan. 2023. Guidelines for How to Approach Thin-Layer Placement Projects. Vicksburg, MS: U.S. Army Engineer Research and Development Center. Report ERDC/EL SR-23-4. <https://dx.doi.org/10.21079/11681/47724>