

ALTERNATIVE USE OF DREDGED MATERIAL: STATE OF LEGISLATION AND EXPERIMENTAL PROJECTS

*From the London Protocol 1996 to the national legislation on dredged materials
.....up to future implementations...*

Cristian Mugnai, PhD

Italian Institute for Environmental Protection and Research (ISPRA)

Roma, Italy



LC/SG 45 Science Day

Alternative uses of waste

Outline



The starting point: LP Dredged material assessment framework

- Beneficial uses
- Sediment as resource

The Italian regulation in force on the management of dredged material

- Weighted Approach of classification
- Possible Management option according to quality (hierarchy)

Experimental project on sediment reuse on land

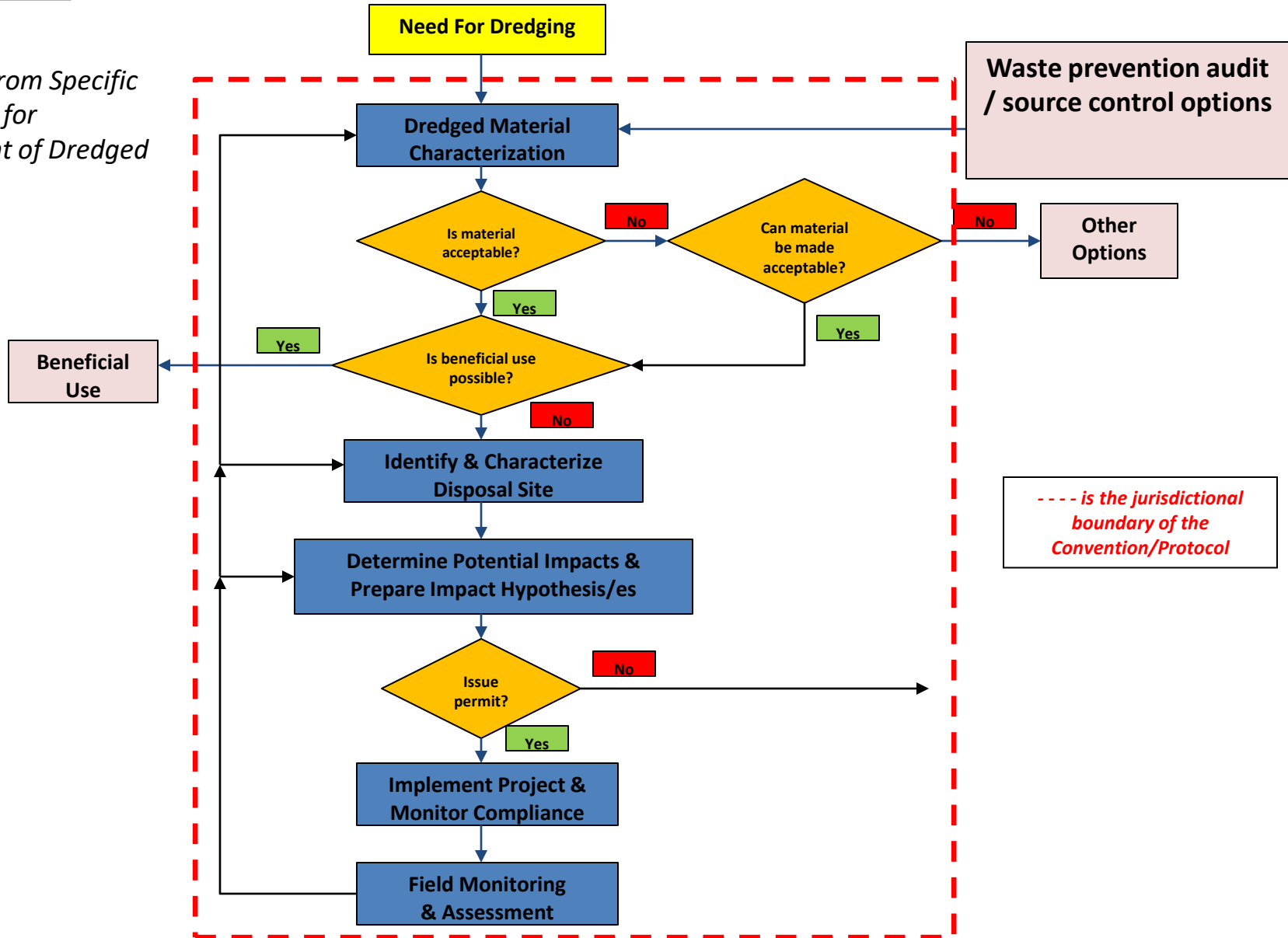
- SEDITERRA
- GRRinPORT

New legislation and future implementation



DREDGED MATERIAL ASSESSMENT FRAMEWORK (LP)

Modified from Specific Guidelines for Assessment of Dredged Material



Specific Guidelines for Assessment of Dredged Material (2014)



1 Introduction

1.1 Sediment is an essential component of fresh water, estuarine and marine ecosystems. Sediment processes play important roles in determining the structures and functions of aquatic systems. Therefore, management processes applied to sediment, in relation to human activities, should recognize that sediment is an important natural resource.

* Revised Specific Guidelines for the assessment of dredged material.
† Refer to article 3.1 of the London Protocol.

WASTE ASSESSMENT GUIDELINES UNDER THE LONDON CONVENTION AND PROTOCOL 13

Overarching considerations

1.4 Three overarching considerations should guide planning and permitting activities related to dredged material management, including disposal at sea, that are in keeping with the intent of the London Convention and Protocol to protect and preserve the marine environment:

.1 Dredged sediment is a resource that should be used for beneficial purposes (as described in paragraphs 3.3 and 3.4), as an alternative to disposal in the ocean, when it is not contrary to the aims of the Convention and Protocol, and is environmentally, technically and economically feasible to do so.

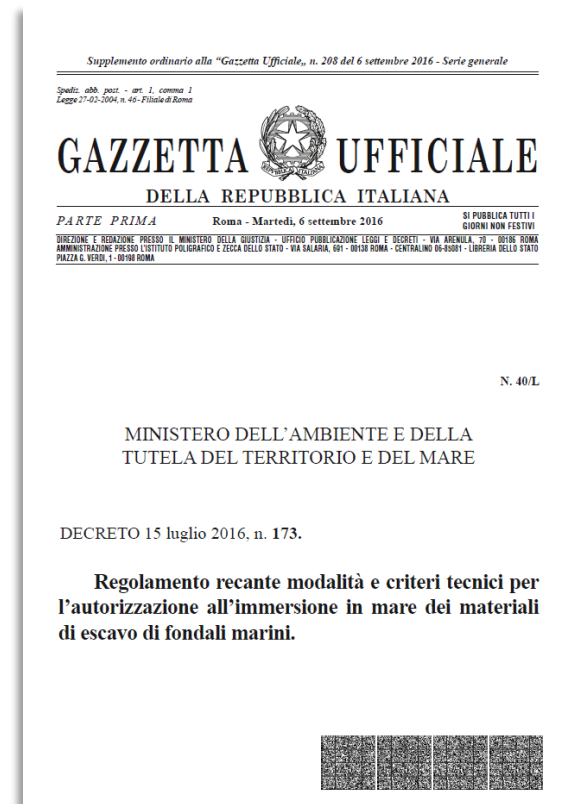


Sediment as a resource to be RE-USED as an alternative to disposal at sea

Environment Ministry Decree n. 173/2016

The Decree of Italian Ministry of Environment n. 173/2016 entered into force on 21 September 2016:

- updates technical procedures on how to apply for a dumping permit for dredging sediments originating from marine and brackish waters or from reclaimed coastal lands;
- the technical Annex **establishes criteria and methodological procedures for dredging sediment characterization, their classification and identification of appropriate management options and monitoring.**



Technical annex

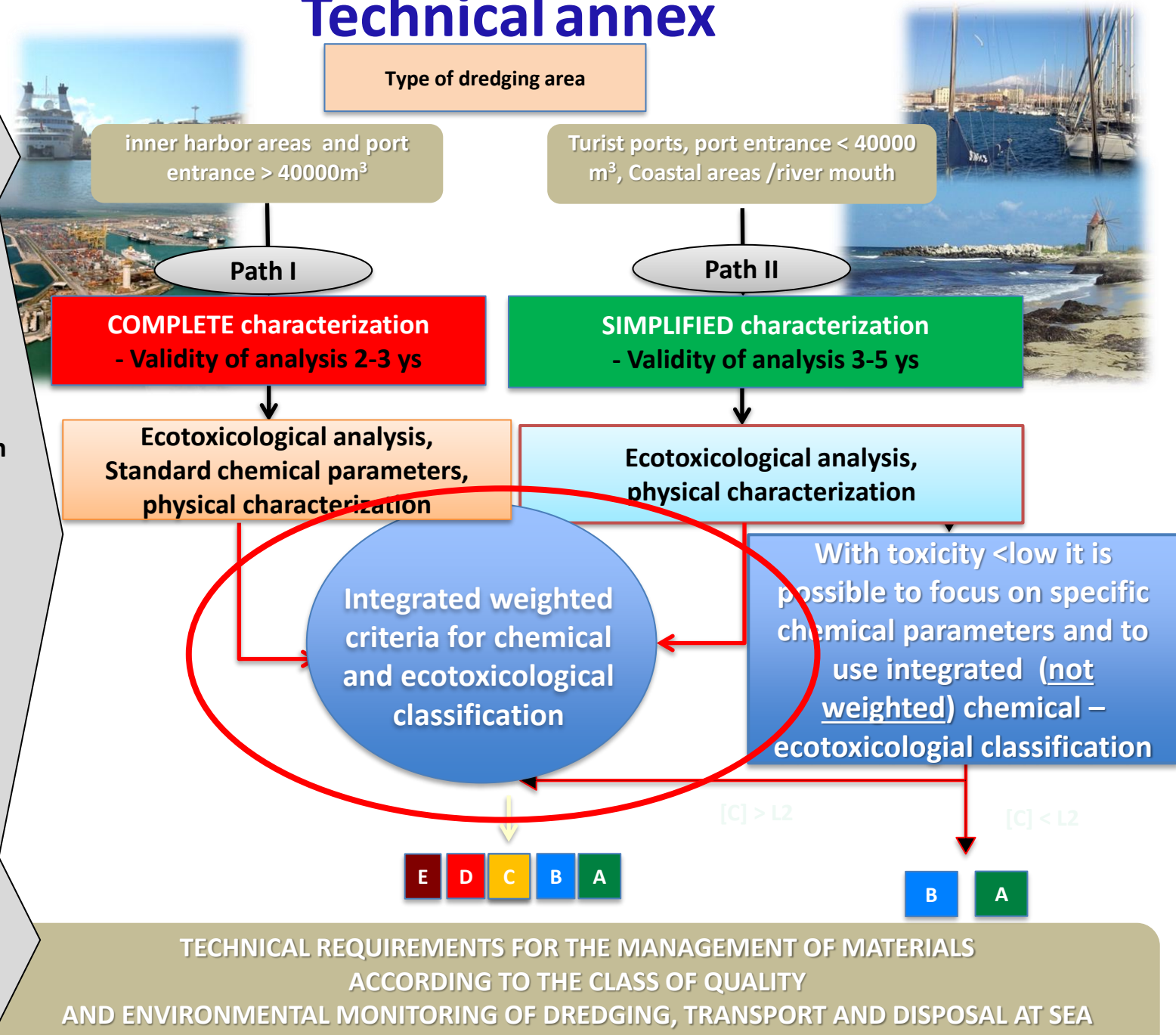
Area information
Chapter 1

Characterization and classification
Chapter 2

Chapter 2

(Path I)
(Path II)

Management and monitoring
Chapter 3



Type of dredging area

inner harbor areas and port entrance > 40000m³

Turist ports, port entrance < 40000 m³, Coastal areas /river mouth

Path I

Path II

COMPLETE characterization
- Validity of analysis 2-3 ys

SIMPLIFIED characterization
- Validity of analysis 3-5 ys

Ecotoxicological analysis,
Standard chemical parameters,
physical characterization

Ecotoxicological analysis,
physical characterization

Integrated weighted
criteria for chemical
and ecotoxicological
classification

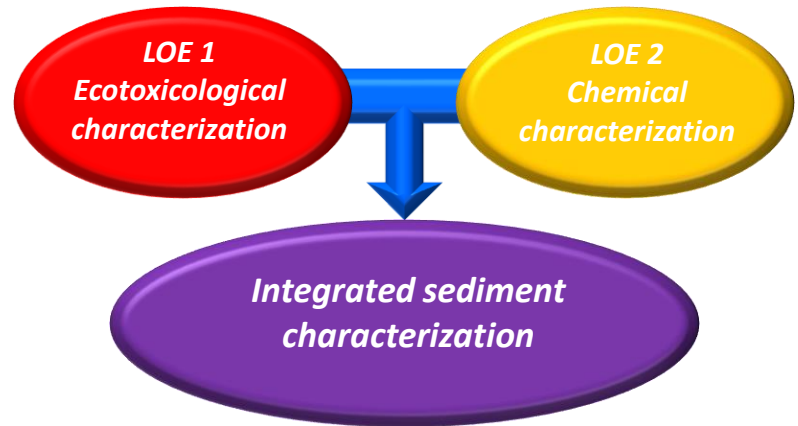
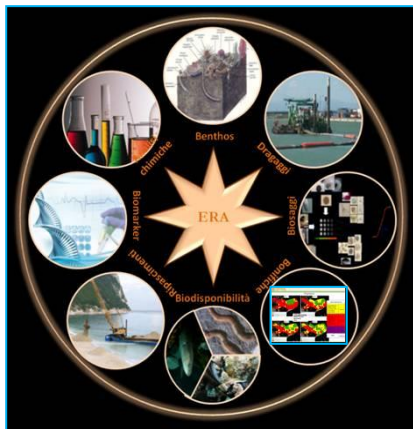
With toxicity <low it is possible to focus on specific chemical parameters and to use integrated (not weighted) chemical – ecotoxicological classification

E D C B A

B A

TECHNICAL REQUIREMENTS FOR THE MANAGEMENT OF MATERIALS
ACCORDING TO THE CLASS OF QUALITY
AND ENVIRONMENTAL MONITORING OF DREDGING, TRANSPORT AND DISPOSAL AT SEA

Integrated Characterization and weighted approach for sediment quality assessment



Ecotoxicological hazard	Chemical hazard	Quality classes
Absent	$HQ_C (L2) \leq \text{Negligible}$	A
	$\text{Slight} \leq HQ_C (L2) \leq \text{Moderate}$	B
	$HQ_C (L2) = \text{High}$	C
	$HQ_C (L2) > \text{High}$	D
Slight	$HQ_C (L1) \leq \text{Slight}$	A
	$HQ_C (L1) \geq \text{Moderate}$ and $HQ_C (L2) \leq \text{Slight}$	B
	$\text{Moderate} \leq HQ_C (L2) \leq \text{High}$	C
	$HQ_C (L2) > \text{High}$	D
Moderate	$HQ_C (L2) \leq \text{Slight}$	C
	$HQ_C (L2) \geq \text{Moderate}$	D
$\geq \text{High}$	$HQ_C (L2) \leq \text{Slight}$	D
	$HQ_C (L2) \geq \text{Moderate}$	E

Italian Environment Ministry Decree n. 173/2016

Class	Management Options (in the marine environment/close to...)
A	<p>Sands (fines < 10%) to be used or re-located in the following hierarchy:</p> <ul style="list-style-type: none"> • Beach nourishment; • Reconstruction of natural structures in marine coastal environments including use for the restoration of shorelines; • Filling of breakwater and embankments in port areas; • Disposal at sea (> 3 NM); • Disposal in aquatic confined facilities <p style="text-align: right;">← LC, LP</p>
B	<p>Material to be used or re-located in the following hierarchy:</p> <ul style="list-style-type: none"> • Disposal at sea (> 3 NM) with recomm. environmental monitoring; • Disposal in confined facilities within port, or capping, with environmental monitoring. <p style="text-align: right;">← LC, LP</p>
C	<ul style="list-style-type: none"> • Disposal in confined facilities able to retain all the grain size fraction of sediment; • Capping, with environmental monitoring.
D	<ul style="list-style-type: none"> • Disposal in completely sealed confines facilities, with environmental monitoring.
E	<ul style="list-style-type: none"> • Material to be managed with special environmental safety procedures, whose removal and handling must be assessed with Environmental Risk Assessment

Experimental Projects



Management of dredging sediments on land

SEDITERRA - “Guidelines for the sustainable treatment of dredging sediments from Italy-France transboundary Maritime area ”
(2017-2020)



REGIONE AUTÒNOMA DE SARDIGNA
REGIONE AUTONOMA DELLA SARDEGNA



- ✓ identify best practices related to the treatment and management on land of dredged marine sediments, sharing European experiences and knowledge building based the results of local approaches



- ❖ comparative study of **current legislation and best practices** adopted in the field of land management of contaminated dredged sediments implemented in Italy and France. Comparison between the different management options and methodologies adopted in the two countries
- ❖ Recognition of the **treatment processed** applied to contaminated sediments, innovative and already of consolidated use in the countries involved, capitalization of the knowledge acquired in previous projects
- ❖ **Experimental activities** through pilot plants for the treatment and valorization of sediments, through the application of soil-washing, bio-remediation and energy recovery techniques - **Drafting of guidelines.**

<https://www.sediterra.net/it/>

<http://interreg-maritime.eu/web/sediterra>



Line of activity: development of management strategies and treatment of contaminated dredging sediments.

- Sediment Washing
- Electrokinetic treatment
- Enhanced landfarming



Experiments on:

- laboratory scale and pilot scale,
- sediments with different chemical-physical characteristics and different levels of contamination from two Italian ports

Main results

Decontamination of port sediments

- Concentration of pollutants
- Reduction of volumes and of disposal costs
- Reuse of decontaminated fractions (circular economy) for other purposes ex. construction, roads, port infrastructures, nourishment
- Combination with other decontamination techniques



Good performance and high expectations especially in combination with electrokinesis tests for heavy metal abatement

- LCA report on the treatments used

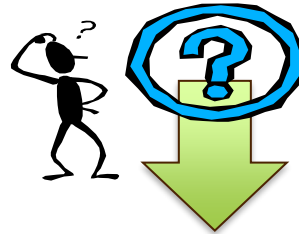
New legislation

(amendment of art 184 quater Dlgs 152/06)

END OF WASTE

In order to promote investments in **circular economy projects**, to foster technological innovation and to guarantee the safety of maritime transport, the competent administrations may authorize, subject to characterization,also for **single particle size fractions, of the materials deriving from the dredging of port and marine-coastal areas** in agreement with the regulations in force, [...], **the reuse of the aforementioned** materials on land and in marine-coastal environments also for single particle-size fraction obtained after mechanical separation.

[.....] the **technical decree** establishing the options for reuse of dredging sediments and every single particle size fraction according to the best available technologies, **still to be issued**



Under discussion: application of the discipline of by-products

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cristian.mugnai@isprambiente.it

THANKS FOR YOUR ATTENTION!