

Dredged Material and Legislation



*Dutch-German Exchange
on dredged material*

Dutch-German Exchange (DGE) on Dredged Material

- Part 1 -

Dredged Material and Legislation

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Participating authorities

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Participating authorities

Dutch delegation

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Ministry of Transport, Public Works and Water Management, Directorate General Water, The Hague

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- AKWA/BWD, Utrecht
- AKWA/DNZ, Rijswijk

Port of Rotterdam (for the community of Dutch cities), Directorate Shipping, Rotterdam

German delegation

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Bonn

Federal Ministry of Transport, Building and Housing, Bonn

Federal Environmental Agency, Berlin

Federal Institute of Hydrology, Koblenz

Ministry of the Environment of Lower Saxony, Hannover

Port Authority of Lower Saxony, Emden

Department for the Environment and Health, Free and Hanseatic City of Hamburg

Department of the Economy and Labour, Port and River Engineering Department, Free and Hanseatic City of Hamburg

Senator for Building and the Environment, Bremen

Senator for Economic Affairs and Ports, Bremen

Ministry for the Environment of North Rhine Westphalia, Düsseldorf

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The participating members of each authority are listed in Annex V.



DGE-Group at Polder Moder/Impoundment Iffezheim/Upper Rhine
13. June 2002

Meetings

December 1999:	Koblenz/D, hosted by the Federal Institute of Hydrology
June 2000:	Lelystad/NL, hosted by AKWA/RIZA
December 2000:	Bonn/D, hosted by the Federal Ministry for the Environment
June 2001:	Rotterdam/NL, hosted by the Port of Rotterdam
June 2002:	Rastatt/D, hosted by the Federal Ministry for the Environment

Abbreviations

BBodSchG	=	Federal Soil Protection and Contaminated Site Act
BLABAK	=	Federal-/Länder-expert group on dredged material handling in coastal waters
BSB	=	BouwStoffen Besluit (Building Materials Decree)
BVB	=	Beleidsstandpunt Verwijdering Baggerspecie (Policy document on the removal of DM (1994))
CDF	=	Confined Disposal Facility
CEDA	=	Central Dredging Association
DGE	=	Dutch German Exchange on Dredged Material
DM	=	Dredged Material
EC	=	European Communities
ECJ	=	European Court of Justice
EU	=	European Union
EURAL	=	EUropese AfvalstoffenLijst (European list of waste materials)
EWC	=	European Waste Catalogue
HABAB	=	German Directive for the handling of DM in inland federal waterways
HABAK	=	German Directive for the handling of DM in coastal federal waterways
HTG-FA	=	Hafenbautechnische Gesellschaft - Fachausschuß Baggergut
ICPR	=	International Commission for the Protection of the River Rhine
PIANC	=	International Navigation Association
KrW-/AbfG	=	(German) Closed Substance Cycle and Waste Management Act
LC	=	London Convention
NW4	=	4e Nota Waterhuishouding (4 th Policy Document on Watermanagement)
OSPAR	=	Commission for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention, Paris 1992)
PMV	=	Provinciale Milieu Verordening (Regional Environmental Ordinance) (The content of the PMV is dictated by the WM)
SEDNET	=	European Sediment Network
TBT	=	Tributyltin
WBB	=	Wet Bodembescherming (Soil Protection Act)
WFD	=	European Water Framework Directive
WM	=	Wet Milieubeheer (Environmental Management Act)
WODA	=	World Dredging Association
WVO	=	Wet Verontreiniging Oppervlaktewateren (Pollution of Surface Waters Act)
WVZ	=	Wet Verontreiniging Zeewater (Pollution of Saltwater Act)

1. General introduction and scope

Economically efficient and environmentally sound management and handling of dredged material (DM) is important both in The Netherlands and in Germany as huge amounts of DM emerge from maintenance, construction and remedial (clean-up) works within water systems. The national volumes of DM amount to about 35 and 50 million m³/year, respectively.

A relatively small but significant part is contaminated, whereas the larger part is clean or only marginally contaminated. It is common practice to relocate the largest part of the DM in the water system in suitable locations. If relocation (aquatic disposal) is undesirable or impossible for environmental, morphological or spatial reasons, alternative options are employed such as beneficial use, treatment and confined disposal. These options generally are more costly.

Against this background and because of the progressing European development, the competent governmental authorities in The Netherlands and Germany started a Dutch German Exchange on DM (DGE) at the end of the year 1999. The status of DGE is informal.

DGE-participants acknowledge the international environmental policy on dredging as formulated by the World Dredging Association (WODA) and the Central Dredging Association (CEDA). This policy includes:

1. Recognition that carefully designed and well executed dredging conducted in an environmentally sound manner contributes to a stronger economy;
2. Conviction that dredging projects can be conceived, permitted, and implemented in a cost-effective and timely manner while meeting environmental goals and specific regulatory requirements;
3. Commitment to the development and implementation of appropriate environmental safeguards and performance guidelines for construction, maintenance, mining and remedial dredging;
4. Encouragement of beneficial use of DM;
5. The need for open lines of communication among stakeholders, such as port interests, dredging contractors, regulatory agencies, other business interests, environmental interest groups, and the public, within any project;
6. Encouragement of investment in and expeditious transfer of new technologies, and the development of new, more efficient techniques for improving the evaluation and safe handling of DM.

The main objective of the Dutch-German Exchange on DM (DGE) is to increase understanding of management, both on policy (national) and practical (project) level, of DM by exchanging experiences and knowledge. In addition, DGE seeks to contribute to EU-wide for that deal, directly or indirectly, with management of DM – in particular the Sediment Network (SedNet).

From this perspective DGE covers different aspects of DM management like legislation, treatment, chemistry, ecotoxicology, dredging technology etc. The sharing of knowledge in these fields requires an analysis (classification and comparison) of DM terminology of both countries in order to get common understanding of the important terms, despite the legal or technical differences and difficulties with regard to the correct translation of terminology used in Germany and The Netherlands.

Scope of this paper

DGE aims to organise information to support the further development of DM management. Information on different aspects will be presented in dedicated documents. This first document covers "DM and Legislation". It comprises important definitions, a comparison of the legislative situation of DM management and important legal questions against a European background. This document forms a stepping-stone to all coming documents (e.g. Part II: Treatment and Confined Disposal) from DGE.

It should be noted that the present regulatory framework for DM management and handling is extremely complex. Depending on the dredging objective and DM destination, different (parts of) international conventions, European and national laws and regulations apply, e.g. for water, soil, waste and environment. Furthermore, current developments on the European level (Water Framework Directive, Soil Communication) are likely to have further impact on national legislation covering activities such as dredging in (international) catchment areas. With regard to the progress of European and national legislation, this document makes no claim to be exhaustive.

2. Summary

This report gives an impression of regulatory regimes and uncertainties on DM in two EU-member states in which dredging is quite an important activity, from both an economic and an environmental perspective. For the countries concerned the conclusion holds that environmental regulation of DM handling is a complex patchwork, severely influenced by various EU directives and with constituents from various disciplines.

The complexity of the patchwork of regulations appears clearly when **definitions** for the same term in the different regulations are compared. It is essential that a harmonised terminology which reflects the processes in the DM handling in a correct and neutral way is going to be established in the EU-countries and world-wide. In chapter 3 the definitions of the most important terms and sub-terms are highlighted in this sense which are supplemented by several more in Annex I.

The **comparison of regulations** in water, waterway, soil, waste and other legislation relevant to DM in the two countries shows at first that The Netherlands has – in contrary to Germany - set national DM guidelines for different pathways of handling into force which are based on a national policy strategy for DM handling. Germany is still working with a variety guidelines/directives which are not nationally harmonised and limited to special areas of competence (e.g. federal waterways, single Länder). The directives HABAK and HABAB have a dominant role and are the starting point in this process of national harmonisation which has started in the coastal area only.

Against this background, it can be concluded that in the fields of **water and waterway legislation** the general criteria for aquatic disposal (relocation) of DM are quite similar. Based on their national directive for subaquatic confined disposal facilities The Netherlands has gathered experiences with some large-scale confined disposal sites (e.g. Slufter, IJsseloo), whereas in Germany subaquatic confined disposal is still applied only in smaller projects (e.g. harbour basins, gravel pits). For the implementation of the Water Framework Directive (WFD) in both countries it is of great importance that aquatic disposal of DM is considered as the most important option of DM handling in present practice. A restriction of aquatic disposal would have significant economic consequences. Currently DM seems not to be considered in the implementation process of the WFD because the handling of sediments and DM is not explicitly mentioned in the WFD. It is clear that DM handling must be an important part of each river basin management plan.

The major difference between the two countries concerning **soil legislation** is that aquatic soils (sediments/DM) are under the scope of soil legislation in The Netherlands. Consequently soil legislation is of greater importance for DM handling in The Netherlands than in Germany where soil legislation has strong influence on DM handling only in the case of re-use of DM upland by covering existing top soil.

Special regard has to be given to the influence of **waste legislation** where new regulations (European Waste Catalogue, European Landfill Directive) were set into force. For the time being, the specific properties of sediments and DM were not sufficiently taken into account within waste legislation. This discrepancy was recognised in the Dutch policy document on the removal of DM and as a result guidelines were formulated specifically for facilities for the disposal of DM. Those Dutch guidelines do take the special properties of the waste “dredged material” into account.

However, in many cases DM has to be regarded as waste during transport and processing. As a consequence especially the waste regulations determine the handling options for DM. In general the demands made in the waste regulations (see also DGE Part II: Treatment and Confined Disposal of DM) determine for a large part the total costs of dredging projects.

If sediment/DM can remain environmentally-safe within the aquatic environment, where they are an essential part of, in Germany there are uncertainties in practice how to deal with waste regulations. In Germany more guidance is needed to clarify the demands of waste regulations in order

to connect those demands to the permission procedure of water legislation. Further guidance has to be developed and harmonised about the demands necessary for aquatic disposal within water and waterway legislation. This need is underlined by the indication in preamble 4 of the European Landfill Directive "whereas further consideration should be given to ... the processing of dredging sludges".

Compared to Germany in The Netherlands it seems to be more clear when and how to deal with waste regulations when aquatic disposal is concerned. In general in The Netherlands DM is regarded as a waste material. Aquatic disposal of certain categories of DM (Class I and II) was made possible by means of an exemption in waste regulations of the Environmental Management Act.

Recently in 2002 new (waste) regulations, came into force in The Netherlands. For example the Act on Environmental Taxes, which is meant to stimulate treatment of (Contaminated) DM in order to minimise the amount of (C)DM that has to be disposed of in confined disposal facilities (CDF). As mentioned in the master plan for the removal of DM for the coming years (Tienjaren-scenario) a large effort has to be made in the Netherlands to remove the arrear in dredging. Therefore it is essential that the new regulations do not hamper the execution of dredging projects. At the moment a monitoring programme is executed in order to evaluate the implications of those regulations on water management.

In general it is concluded that there is a need for a more appropriate and less complex regulatory framework for the handling of DM in both countries.

Summary in Dutch/Samenvatting

Dit rapport geeft een overzicht van het juridisch kader ten aanzien van de omgang met Baggerspecie in twee EU lidstaten, Duitsland en Nederland. In beide landen is baggeren een belangrijke activiteit omwille van economische maar ook milieuhygiënische redenen. Geconcludeerd is dat de regelgeving ten aanzien van de milieuhygiënisch verantwoorde omgang met baggerspecie in beide landen een complex kader vormt dat sterk wordt beïnvloed door Europese en nationale richtlijnen die betrekking hebben op verschillende beleidsvelden als "bodem", "water" en "afval". (De complexiteit van de regelgeving maakt de interpretatie daarvan moeilijk en in de baggerpraktijk kan dit leiden tot misverstanden.)

De complexiteit van de regelgeving ten aanzien van baggerspecie wordt zichtbaar als de definitie van een bepaalde begrip in diverse regelingen wordt opgezocht. Veelal wordt per regeling een specifieke definitie gehanteerd. Het wordt van essentieel belang geacht dat op Europees niveau of wereldwijd een gemeenschappelijk begrippenkader wordt ontwikkeld waarmee de activiteiten en processen relevant voor de omgang met baggerspecie op een correcte en eenduidige manier worden gedefinieerd. In hoofdstuk 3 is toegelicht welke definities in dit rapport gehanteerd worden en wordt in het algemeen ingegaan op definities van de belangrijkste termen. In Annex II is een overzicht opgenomen van belangrijke termen en definities.

De vergelijking van regelgeving op het gebied van water, waterwegen, bodem, afval en andere voor baggerspecie relevante regelgeving laat zien dat Nederland, in tegenstelling tot Duitsland, specifiek nationaal beleid voor de omgang met baggerspecie heeft ontwikkeld en in wetgeving heeft geïmplementeerd. In Duitsland is geen sprake van harmonisatie van regels op nationaal niveau, maar wordt gebruik gemaakt van richtlijnen specifiek voor bepaalde gebieden (waterwegen of Bundeslanden). De richtlijnen HABAK en HABAB zijn startpunt voor het proces van harmonisatie van regelgeving in Duitsland. De harmonisatie heeft vooralsnog uitsluitend betrekking op de omgang met baggerspecie in kustgebieden (HABAK).

De regelgeving op het gebied van water en waterwegen is in beide landen vergelijkbaar als het gaat om de algemene criteria voor het verspreiden van baggerspecie in oppervlaktewater (aquatic disposal/relocation). In Nederland is tevens ervaring opgedaan met het subaquaatsch bergen (confined aquatic disposal) van verontreinigde baggerspecie in speciaal daarvoor aangelegde inrichtingen (Slufter, IJsseloog). Dergelijke inrichtingen moeten voldoen aan de Nederlandse richtlijnen voor grootschalige baggerspeciedepots zoals opgenomen in het Beleidsstandpunt Verwijdering Baggerspecie. In Duitsland heeft men op kleinere schaal (havenbekkens, zandwinputten) ervaring met het subaquaatsch bergen van baggerspecie.

Voor het implementeren van de Europese Kader Richtlijn Water (KRW) in beide landen, is het van groot belang dat onderkend wordt dat het verspreiden van baggerspecie in oppervlaktewater dagelijkse praktijk is in de huidige situatie. Het inperken van deze mogelijkheid zal grote economische consequenties hebben voor de baggerpraktijk. Op dit moment wordt de omgang met baggerspecie niet meegenomen bij het implementeren van de KRW omdat baggerspecie niet expliciet is benoemd. Desalniettemin is de hand de omgang met baggerspecie van groot belang voor het waterkwaliteitsbeheer.

Een belangrijk verschil tussen Duitsland en Nederland is dat in de Nederlandse regelgeving op het gebied van bodem betrekking heeft op terrestrische en aquatische bodems (waterbodem). In Duitsland is het begrip waterbodem niet verankerd in de regelgeving ten aanzien van bodems. Gevolg hiervan is dat in Nederland de bodemregelgeving van grotere invloed is op de omgang met baggerspecie dan in Duitsland. In Duitsland is de bodemregelgeving uitsluitend relevant indien baggerspecie op land wordt gebracht/toegepast.

De invloed van de afvalregelgeving op de omgang met baggerspecie verdient speciale aandacht. Betrekkelijk recent is bijvoorbeeld de Europese Richtlijn betreffende het storten van afvalstoffen van kracht geworden. De internationale regelgeving ten aanzien van afvalstoffen, houdt in het algemeen geen rekening met de specifieke functie van sedimenten voor het watersysteem of met de specifieke eigenschappen van sediment en baggerspecie. Dit is door Nederlandse beleidsmakers onderkend, en heeft ertoe geleid dat voor stortplaatsen voor de afvalstof baggerspecie specifieke richtlijnen zijn ontwikkeld. Deze richtlijnen, voor stortplaatsen op land (implementatie van EG-richtlijn 1999/31/EC middels Ministeriële Regeling, 2001) en voor stortplaatsen “onder aan de oppervlakte staand water” (richtlijnen zoals opgenomen in Beleidsstandpunt Verwijdering Baggerspecie, 1993), houden wel zoveel mogelijk rekening met de specifieke eigenschappen van baggerspecie.

In veel gevallen zal baggerspecie beschouwd moeten worden als een afvalstof. Transport en ver-/bewerking van dergelijke baggerspecie (afval) dient daarom conform de afvalstoffenregelgeving plaats te vinden. De daaruit voortvloeiende kosten vormen veelal de grootste kostenpost voor baggerprojecten (zie ook DGE Part II: Treatment and Confined Disposal of DM).

Als baggerspecie/sediment op een milieuhygienisch verantwoorde wijze binnen het watersysteem, waarvan sediment overigens een belangrijke component is, kan worden teruggeplaatst, is het in Duitsland niet altijd duidelijk in hoeverre ook de afvalregelgeving van toepassing is. In Duitsland bestaat behoefte aan duidelijkheid over de eisen die vanuit de afvalregelgeving in acht genomen zouden moeten worden, zodat deze eisen gekoppeld kunnen worden aan de vergunningenprocedures die op grond van de Duitse waterregelgeving noodzakelijk zijn voor het uitvoeren van baggerprojecten. Ook is er behoefte aan een verdere uitwerking en harmonisatie van criteria voor het verspreiden van baggerspecie in de “waterregelgeving”. De noodzaak hiervoor wordt onderstreept door de hetgeen is opgenomen in overweging 4 van de Europese Richtlijn betreffende het storten van afvalstoffen: “.. nog verder moet worden nagedacht over de “verwerking” van baggerspecie”.

In Nederland lijkt meer duidelijkheid te bestaan over de relevantie van afvalregelgeving op het verspreiden van baggerspecie in oppervlaktewater. In het algemeen wordt baggerspecie in

Nederland als afvalstof beschouwd. Verspreiden van baggerspecie in oppervlaktewater is mogelijk gemaakt door voor klasse 1 en 2 baggerspecie een uitzondering te maken op het “stortverbod buiten inrichting” uit de WM.

Recent, in 2002, is in Nederland nieuwe (afval) regelgeving in werking getreden. Bijvoorbeeld de Wet belastingen op milieugrondslag, welke is bedoeld om verwerkingstechnieken voor baggerspecie te stimuleren en de hoeveelheid in specifieke inrichtingen te storten verontreinigde baggerspecie te reduceren. Zoals aangegeven in het Tienjarensenario zal een grote inspanning noodzakelijk zijn om de in Nederland opgelopen baggerachterstand in te halen. Daartoe is het noodzakelijk dat nieuwe regelgeving de uitvoering van baggerprojecten niet belemmerd. Daarom is een monitoringsprogramma gestart om de gezamenlijke implicaties van de recente regelgeving voor baggerprojecten te evalueren.

De algemene conclusie van dit rapport is dat er in beide landen behoefte bestaat aan minder complexe en doelmatiger regelgeving met betrekking tot de omgang met baggerspecie.

Summary in German/Zusammenfassung

Dieser Bericht zum Umgang mit Baggergut gibt einen Überblick über die gesetzlichen Systeme und Unsicherheiten in zwei EU-Mitgliedsstaaten, in denen das Baggern sowohl aus ökonomischer als auch aus ökologischer Sicht eine bedeutende Tätigkeit ist. Für beide Länder lässt sich zusammenfassen, dass die umweltrelevanten, gesetzlichen Regelungen zum Umgang mit Baggergut ein komplexes Gebilde sind, das stark von den verschiedensten EU-Richtlinien und Bestandteilen verschiedenster Umweltbereiche beeinflusst wird.

Die Komplexität dieser rechtlichen Vorgaben wird vor allem beim Vergleich von **Definitionen** gleicher Begriffe in den verschiedenen Regelwerken deutlich. Es ist daher erforderlich, eine harmonisierte Terminologie in der EU und weltweit einzuführen, die die Prozesse im Umgang mit Baggergut in korrekter und neutraler Weise widerspiegelt. In Kapitel 3 werden in diesem Sinne die Definitionen der wichtigsten Begriffe hervorgehoben, die durch weitere im Anhang I ergänzt werden.

Der Vergleich der Baggergut betreffenden **Regelungen** im Wasser-, Wasserstrassen-, Boden-, Abfall- und anderem Recht in beiden Ländern zeigt auf den ersten Blick, dass die Niederlande, im Gegensatz zu Deutschland, nationale Richtlinien für die verschiedenen Möglichkeiten im Umgang mit Baggergut in Kraft gesetzt haben, die auf einer nationalen Strategie zum Umgang mit Baggergut basieren. In Deutschland wird noch mit einer Reihe von Regelungen gearbeitet, die national nicht harmonisiert sind und nur für bestimmte Zuständigkeitsbereiche gelten (z.B. Bundeswasserstrassen, einzelne Bundesländer). Die Handlungsanweisungen HABAK und HABAB nehmen hier eine führende Rolle ein und stellen den Beginn im Prozess der nationalen Harmonisierung dar, die bislang nur für den Küstenbereich stattfindet.

In diesem Zusammenhang kann festgestellt werden, dass die allgemeinen Kriterien für die aquatische Unterbringung von Baggergut in beiden Ländern in den Bereichen der **Wasser- und Wasserstrassengesetzgebung** recht ähnlich sind. Basierend auf ihrer nationalen Regelung für subaquatische Ablagerung von Baggergut haben die Niederlande mit einigen großangelegten Projekten (z.B. Slufter, Ijsseloog) Erfahrungen gesammelt, wohingegen in Deutschland die subaquatische Unterbringung nur in kleineren Projekten angewendet wird (z.B. Hafenbecken, Kiesgruben). Für die Umsetzung der Wasserrahmenrichtlinie (WRRL) ist es in beiden Ländern von großer Bedeutung, dass die aquatische Unterbringung von Baggergut als die wichtigste Option im Umgang mit Baggergut in der Praxis angesehen wird. Eine Einschränkung der aquatischen Unterbringung hätte bedeutende ökonomische Folgen. Zur Zeit scheint Baggergut im Umsetzungsprozess der Wasserrahmenrichtlinie nicht berücksichtigt zu werden, da der Umgang mit Sedimenten und Baggergut in der Wasserrahmenrichtlinie nicht ausdrücklich erwähnt wird. Es

ist klar, dass der Umgang mit Baggergut ein wichtiger Teil eines jeden Flussgebiets-Bewirtschaftungsplans sein muss.

Hinsichtlich der **Bodenschutzgesetzgebung** besteht der wichtigste Unterschied der beiden Staaten darin, dass aquatische Böden (Sedimente) in den Niederlanden in der Bodenschutzgesetzgebung mit erfasst sind. Daher betrifft die Bodenschutzgesetzgebung in den Niederlanden den Umgang mit Baggergut (Sedimenten) in stärkerem Maße als in Deutschland, wo die Bodenschutzgesetzgebung sich auf die Ablagerung von Baggergut auf Böden an Land beschränkt.

Besondere Beachtung muss dem Einfluss der **Abfallgesetzgebung** gegeben werden, wo neue, Baggergut-relevante Regelungen in Kraft getreten sind (Abfallverzeichnisverordnung, Deponieverordnung). Bislang sind die besonderen Eigenschaften der Sedimente und des Baggergutes in der Abfallgesetzgebung nicht genügend beachtet worden. Diese Diskrepanz wurde in den Niederlanden in einem nationalen, politischen Strategiepapier zur Bewältigung des Baggergutaufkommens aufgegriffen und es entstanden spezielle nationale Richtlinien für die gesicherte Ablagerung von Baggergut. Diese nationalen Richtlinien widmen sich den Besonderheiten des Baggergutes, das generell als Abfall eingestuft wird. In vielen Fällen muss Baggergut als Abfall während des Umgangs (Transport, Behandlung) eingestuft werden. Dann bestimmen die Abfallvorschriften die Möglichkeiten beim Umgang mit Baggergut und deren Anforderungen sind kostenbestimmend (siehe Bericht DGE Teil II: Behandlung und gesicherte Ablagerung).

Wenn Sedimente/Baggergut umweltverträglich in der aquatischen Umwelt verbleiben können, wo sie eine wichtige Rolle einnehmen, bestehen in Deutschland Unsicherheiten in der Praxis, wie mit den Abfallvorschriften umzugehen ist. Daher wird in Deutschland mehr Hilfestellung im Vollzugsgeschehen benötigt, wie die Anforderungen des Abfallrechtes in die wasser- bzw. wasserstraßenrechtlichen Genehmigungs-/Benehmungsverfahren einbezogen werden sollen. Desweiteren sind praxisbezogene, harmonisierte Empfehlungen zu entwickeln, die die generellen Anforderungen bei der aquatischen Unterbringung von Baggergut im Wasser- und Wasserstraßenrecht aufzeigen. Diese Notwendigkeit wird dadurch betont, dass in der Präambel 4 der EU-Deponie-Richtlinie angezeigt wird, dass "der Behandlung von Baggerschlämmen (Baggergut) weitere Beachtung gegeben werden muss".

Im Vergleich mit Deutschland scheint in den Niederlanden der Umgang mit der Abfallgesetzgebung für die aquatische Unterbringung mit weniger Unsicherheiten behaftet zu sein. Baggergut wird generell als Abfall angesehen. Die aquatische Unterbringung von nicht oder gering belastetem Baggergut (Klassen I und II) wurde durch Ausnahmeregelungen im niederländischen Abfallrecht festgeschrieben. Im Jahr 2002 traten in den Niederlanden neue Regelungen in Kraft. Beispielsweise soll das Gesetz für Umweltsteuern die Behandlung von (belastetem) Baggergut stimulieren, um Deponieräume zu schonen. Gemäß einem 10-Jahresplan zur Unterbringung von Baggergut sollen in den nächsten Jahren nun große Aktivitäten unternommen werden, um die Engpässe bei der Baggerei zu beseitigen. Gegenwärtig wird daher in den Niederlanden geprüft, welche Auswirkungen die bestehenden Regelungen auf die Wasserbewirtschaftung haben.

Generell besteht Einigkeit, dass in beiden Staaten der Bedarf für ein besser geeignetes und weniger kompliziertes Regelwerk für den Umgang mit Baggergut (Sedimenten) vorhanden ist.

3. Important Definitions

The dredging and DM management terminology is not yet harmonised with definitions being used in water, soil and waste legislation. Furthermore the special terminology from other scientific and technical disciplines (like hydrology, waste water treatment) using similar or even identical terms can cause serious misunderstandings, which may end up in a bad image and inadequate handling of DM. It is not unusual in daily dredging business that DM is regarded generally as something dangerous which is in fact not true for most of the material being dredged. Terms like dredging spoil or dredging sludge which are in use in EU directives (Waste Catalogue, Landfill Directive) are emphasising the negative image. DGE-participants prefer to use the term DM. Consequently the term DM must be used in a neutral or, better even, positive sense (e.g. relevant part of a water system, secondary raw material).

To avoid misunderstandings, it is of importance to have a common understanding of the important terms for sediment and DM management. There have been done some good efforts already, e.g. by the International Navigation Association (PIANC) to set up a special glossary, which defines important technical dredging terms on a worldwide scale. This is a good starting point to add definitions from official (EU) legislation.

The correct understanding of the following terms are of fundamental importance. In this document three important activities within dredging projects were distinguished: 1. **dredging** itself (uptake of DM), 2. **transportation** of DM and 3. **disposal** of DM. The term disposal, as used in this document, comprises various aquatic and upland disposal options (see fig. 3-1).

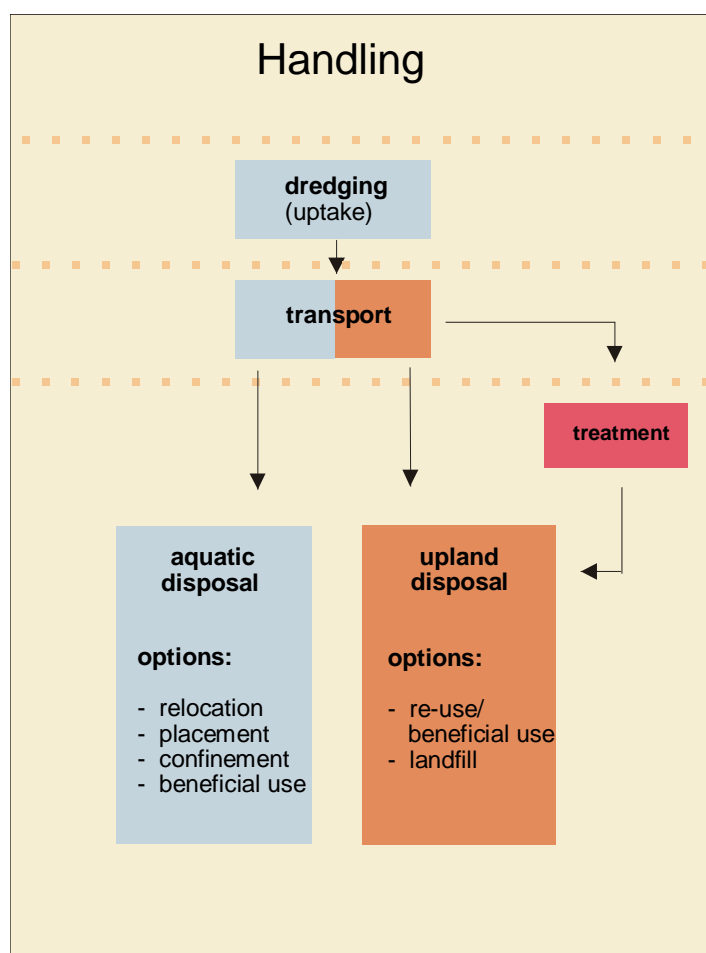


Fig. 3-1: Scheme of important terms

The term **disposal** is being used here in a broad sense without any legislative prejudgement (e.g. by the EC Framework Directive on Waste, Council Directive 75/442/EEC) and includes operations for final disposal and recovery.

A key term in DM management is "**aquatic disposal**" which is common practice for very large amounts of DM. From the basic understanding, aquatic disposal can mean the relocation, the placement on the water bottom or the disposal in a confined/contained facility with or without capping within the water system by technical means (see Annex I). "**Upland disposal**" comprises any unrestricted or restricted re-use or beneficial use on land and the disposal in permitted waste facilities (landfill).

If the handling chain includes (pre-) **treatment** (usually before upland disposal) the term "processing" can be used instead of handling to emphasise this special step. Annex I gives an overview of important terms and existing international, German and Dutch definitions, starting with the definition of **DM**.

In chapter 5 some important questions from the dredging business are raised and answered. The answers show that the implementation of given laws and definitions are not that simple in this context and that there are differences between The Netherlands and Germany. These are mainly due to differences in national/federal legislation in which certain activities of dredging projects are defined. Because of the differing scope of German and Dutch regulations (see chapter 4), definitions of terms and of certain activities in dredging projects are seldom completely identical.

For example the definition of the term "**waste**" is of very big importance for the approval procedures and the resulting costs in dredging projects. The answer to the question: "When is DM waste?" can be found in the European and national waste laws, but it is not sufficiently explained for the practical use in daily routine (see chap. 4.3.4 and 5.1).

Further, it has to be considered carefully if and how terms from soil legislation (e.g. aquatic soil) are used in the context of DM management (see Annex I and chapter 4.3.3).

Please consider the definitions of all the important terms in Annex I and be aware of their use. The correct understanding and use of these terms against the background of the dredging business is the fundament for the next chapters and reports of DGE and all coming exchange on the national and European platform regarding management of DM (sediments).

4. Comparison of the legislative situation in The Netherlands and Germany

The legislative situation for DM in both countries is quite complex, as indicated in chapter 3, in the absence of comprehensive laws that govern all aspects of DM handling. Therefore, the question "Which DM handling options are possible/acceptable?" can be answered only by consulting multiple regulations made for different purposes. Regulation regimes largely depend on the destination and the degree of contamination of DM. Consequently, many projects require case-by-case decisions on permissions and the definition of conditions within them.

This document distinguishes the following types of regulations:

- National policy document,
- International convention,
- Law/Act (at European, national or regional levels),
- Ordinance/Decree,
- Guideline,
- Recommendation,
- Standard.

DGE has screened international/European and national regulations for relevance to DM. This resulted in a survey table (see Annex II) that enables identification and analysis of differences and similarities in legislation. The table clarifies the relation between European legislation (with obligatory transposition into national legislation) and national/federal legislation. In the end, the survey table turned out to be very complex. Therefore, the table includes comments and explanations. Explanation to the Dutch regulations is given in a working paper in Annex IV. The following text summarises important comments from the survey table in short form.

4.1 National policy documents

In The Netherlands there is a national policy document on water-management in use (NW4) for the period 1998-2006. It gives an overall strategy for water-management in The Netherlands including specific quality criteria (target and/or risk levels) for surface water, and sediments (DM). The policy document also contains specific criteria for aquatic relocation of DM in seawater. In general, quality criteria for DM, and surface water (freshwater) have a regulatory link to the Soil Protection Act (WBB) and the Pollution of Surface Waters Act (for seawater WVZ, and freshwater WVO) too. In addition to the policy document on water-management, there is a governmental policy document on the removal of DM (BVB, 1994), which describes the policy on DM management in The Netherlands. A national directive for large (aquatic) disposal sites is part of the governmental policy document on the removal of DM. Very important in this directive are the criteria for the protection of groundwater quality. Recently, also a master plan for the removal of DM was presented in The Netherlands (*Tienjarensscenario*). The master plan made clear that in recent years the amount of DM didn't equalise the sedimentation-rate. Consequently the total amount of sediments that have to be removed from Dutch waterways has increased. In order to make up this arrear in dredging, large efforts have to be made in the near future.

In Germany, comparable policy documents for DM do not exist. National water quality criteria for inland waters (freshwater) were developed by the LAWA (Länder Expert Group on Water). This classification includes quality criteria for suspended matter but not for DM. The system is going to be revised and is foreseen for implementation as part of the EC-Water Framework Directive. For DM in the coastal region there is a political mandate between the federal government

and the regional (Länder) governments at the coast to work out a national recommendation for the handling of DM in coastal waters (North Sea and Baltic Sea). The work of this expert group (BLABAK) has not been finished yet. As part of this work, a recommendation for the handling of TBT-contaminated DM in coastal waters was introduced in November 2001 (BLABAK TBT-Concept).

4.2 International conventions

Both countries have signed the London Convention (LC, 1972) for the protection of the marine environment. LC has set up a DM framework (DMAF). DMAF is considered within the OSPAR-Convention.

Relevant for both countries is the OSPAR Convention for the Protection of the Marine Environment in the North East Atlantic, which includes OSPAR-Guidelines for the management of DM (1998). In The Netherlands and Germany the OSPAR-Guidelines which regulate the relocation of DM in seawater (aquatic disposal) were implemented. The Netherlands has implemented this within the Sea Water Pollution Act (Ordinance). Germany has done this by a specific DM guideline for the federal coastal waterways (HABAK) and is working to transfer this on a national level (BLABAK). The technical criteria for the aquatic disposal of DM differ. This issue is foreseen to be dealt with in detail in another DGE document.

Together with France and Switzerland, The Netherlands and Germany are partners within the International Commission for the Protection of the River Rhine (ICPR). The ICPR has set up a guideline for the relocation of DM in the River Rhine in 1997. The DM guideline from the International Commission for the Protection of River Rhine (ICPR) has a similar approach as HABAB in Germany (see chapter 4.3.2).

4.3 Laws, Ordinances, Guidelines

During dredging projects, regulations for water, soil, waste or other environmental areas have to be regarded. The relevance of those regulations is dependent on the activity of each dredging project. For example in The Netherlands permits are needed for the excavation of contaminated DM, and other permits are needed again for the confined disposal or re-use (beneficial use) of the DM.

4.3.1 Water regulations

Surface waters

The *European Water Framework Directive (WFD)*, which came into force in 2000, will replace existing EC-directives for surface water and groundwater within the subsequent 7 years.

DM and sediments are not mentioned explicitly in the WFD. Germany and The Netherlands expect that the EU-WFD is likely to have implications on DM handling, since sediments have an influence on water quality. An increased monitoring requirement for selected substances (see priority list in Annex 10 of WFD) is expected. Furthermore, it is not clear yet whether and how the demands of the WFD about “heavily modified waters (e.g. waterways)” will affect the DM management.

The general approach to dredging and relocation (aquatic disposal) of DM is in principle the same in Germany and The Netherlands, including permissions and standards. DM can be relocated in surface waters (freshwater and saltwater) under specific conditions, which guarantee no

harm to the environment (see also Annex II) or on the banks alongside small regional waterways (freshwater), instead of disposing of it in specific landfills/facilities. Quality criteria are used both in Germany and The Netherlands to decide if relocation in waters/waterways is possible in an environmentally sound manner. However, the contents and levels of the standards are different, and in addition standards for sediments are more detailed in The Netherlands. In Germany, there is a *DM guideline for River Elbe* that is in use by the Länder (Arge Elbe). This guideline has a comparable approach to the relocation (aquatic disposal) of DM as the *Dutch Pollution of Surface Waters Act*. However, the *Dutch Pollution of Surface Waters Act* is relevant to all surface waters in The Netherlands while the Arge Elbe is relevant to the non-federal part of the River Elbe only.

Groundwater

In Germany, the approach to protect groundwater and the relevant regulations have been harmonised with soil and waste regulations regarding the disposal of mineral substances (e.g. DM). In The Netherlands, groundwater is protected by the Soil Protection Act, as groundwater is regarded part of the soil. Groundwater is protected implicitly in several decrees and other regulations based on the *Dutch Soil Protection Act* and the *Dutch Environmental Management Act*. General principle in Dutch and German soil protection legislation is prevention of contamination of soil and groundwater by reducing emission of pollutants to soil and groundwater.

4.3.2 Waterway regulations

In The Netherlands, the main water systems have to be managed and maintained by the State (Rijkswateren), whereas regional water systems are managed and maintained by water boards (waterschappen) or the regional authorities (provinces). In the Dutch situation, the management of waterways is also regulated by a number of acts. These acts appoint the responsible authorities for the management of waterways, but they are not very relevant to the management and handling of DM. The handling and management of the DM is regulated by the soil, water and other environmental acts.

In Germany, the *Federal Waterways Act* regulates the maintenance of the federal waterways in all 16 Länder for navigation (including the control of water levels, water discharge, morphology, dredging etc.) under consideration of drinking water management and the environment. DM can be relocated in the water (aquatically disposed) if the criteria of the DM directives *HABAB* (inland) and *HABAK* (coastal) are adhered and if it is in accordance with waste and water regulations. *HABAB* (2000) and *HABAK* (1999) deal with all relevant and obligatory steps in DM management on federal waterways and make sure that DM handling will not harm the environment.

4.3.3 Soil regulations

The *Dutch Soil Protection Act* includes aquatic soils (sediments/DM) and gives quality criteria for soils, aquatic soils and groundwater. The Soil Protection Act is divided into a soil protection section and a soil remediation section. Both sections deal with aquatic and terrestrial soils and groundwater. The protection section prevents soil degradation and addresses all kinds of soil quality threatening activities. The soil remediation section regulates whether or not action should be taken on contaminated soils and what kind of action that should be. Quality standards for soil and groundwater are included. An ordinance to the prevention section of this act (but also to the Pollution of Surface Waters Act) is the *Building Material Decree*, which makes a difference between 3 categories of building materials. The difference is based upon the leaching of the building material. The Dutch Building Material Decree (see Annex III) has been notified to conform to the *European Construction Products Directive*.

In Germany the *Federal Soil Protection and Contaminated Site Act* has in general the same goals like Dutch Soil Protection Act. The rules for practice were set into force by the *Federal Soil Protection and Contaminated Site Ordinance*. The main difference between the Dutch and the German Soil legislation regarding DM is that the aquatic soils (bottom sediments) are not in the scope of the German Soil legislation (BBodSchG). The German soil regulations (act and ordinance) relate to upland disposal (re-use/beneficial use) of DM. There is a close connection to waste legislation with regard to restoration of contaminated sites. Permits are needed if DM shall be placed on soils for further (e.g. agricultural) use. These permits have to include an expertise about the soil planned to be covered by DM and the DM itself with regard to possible deterioration of soil and groundwater quality or other subjects of protection connected with soil. In consequence of the introduction of the Federal Soil Protection Act and Ordinance (BBodSchV) the soil standards in different environmental regulations are going to be harmonised with regard to groundwater protection.

A European soil protection directive does not exist, but the European Committee issued a communication paper as basis for discussion on the development of an *EU Soil Strategy*. The *European Construction Products Directive*, that aims to harmonise European legislation for the market of building materials in the EU, has relevance to this discussion. The Construction Products Directive regulates the re-use (beneficial use) of soils or soil material as building material and therefore could interfere with national soil policy. As explained above, in The Netherlands the use of soils or soil material as building material is part of the Soil Protection Act.

4.3.4 Waste regulations

National waste regulations in both Germany and The Netherlands are strongly influenced by the European waste policy. Main goals of the European waste policy are the avoidance of waste, the stimulation of re-use or beneficial use of waste, and to ensure that the handling of waste is safe. Waste which cannot be used environmentally sound has to be treated and/or to be disposed of in waste facilities (landfill).

The superior definition of waste is given by the *European Framework Directive on Waste* and is implemented exactly in the national waste regulations of The Netherlands and Germany (see definition in Annex I). Because of this superior definition of waste all DM that has to be discarded without any further use is waste irrespective of its contamination. Chapter 5.1 deepens the question when the term waste applies to DM. In any case European and national waste regulations are relevant to DM.

The European Waste Catalogue - (EWC) was revised (last by Council Decision 2000/532/EC of 3 May 2000), and DM is mentioned in the waste code 17 05 (Soil and dredging spoil) differentiated in sub-codes 17 05 05* (Dredging spoil containing dangerous substances) and 17 05 06 (Dredging spoil other than those mentioned in 17 05 05) which are implemented in national waste regulations in Germany and The Netherlands. The classification in these sub-codes is the determination of non-hazardous or hazardous waste, which is of significant cost-relevance in practice. If DM is waste, usually it is non-hazardous given the chemical criteria of the European list of waste materials 2000/532/EEC (see Annex I). There are still uncertainties on how to deal in practice with the classification criteria H14 "ecotoxic".

The European Landfill Directive (1999/31/EC) regulates the landfilling of waste, including DM. If DM will be disposed of upland without any further use, it has to be decided which category of landfill has to be chosen. Technical demands for those landfill categories (disposal facilities) are defined in the European Landfill Directive.

An important exemption for DM is made in article 3: "...the deposit of non-hazardous dredging sludges alongside small waterways from where they have been dredged out and of non-

hazardous sludges in surface water including the bed and its sub-soil” is excluded from the scope of the European Landfill Directive. This exemption is implemented in the Dutch waste legislation (Environmental Act) for “lightly contaminated DM” as defined in the Dutch Soil Protection Act. The German Landfill Ordinance (DepV, 2002) does not explicitly highlight the exemption of the European Landfill Directive for aquatic disposal of DM. But the relocation of DM in surface waters (freshwater and saltwater) has to be licensed by means of the water legislation under consideration of waste regulations both in Germany (see chap. 5.1) and in The Netherlands in daily practice (D: Umlagern; NL: Verspreiden).

A new Dutch policy for the disposal of DM on land is in preparation.

In The Netherlands there is a national ministerial decision under the Environmental Management Act for the disposal of non-hazardous DM in landfills. By means of this ministerial decision the European Landfill Directive was implemented in Dutch legislation. The ministerial decision can be regarded as the Dutch directive for upland (*above groundwater*) confined disposal facilities (CDFs) for DM. It defines the “maximum” impact on groundwater that is regarded as tolerable. This Directive is similar to the Dutch directive for large-scale (aquatic) disposal sites for DM that is part of the policy document (BVB) on the removal of DM (as mentioned before in paragraph 4.1), and has to be applied on CDFs within groundwater. Both directives do not prescribe specific isolative means, but define the maximum tolerable effects on groundwater quality. The maximum tolerable effects are in line with the goals of the Dutch soil protection policy. It is possible that in the near future both Dutch directives for confined disposal facilities for DM will be combined.

Germany does not have comparable national DM guidelines for the disposal alongside small waterways and for confined disposal facilities. The term “small waterway” is not defined in any German law or standard. Within the new German Landfill Ordinance the special characteristics were considered with some compromises which allow waste authorities to permit upland DM disposal sites in an adequate way.

The German DM directives HABAK (coast) and HABAB (inland) apply to all German federal waterways (7700 km) which do not include waterways/ports/reservoirs/rivers/lakes under the competence of the 16 Länder. HABAK and HABAB do not regulate the disposal of DM alongside small waterways (exemption in the European Landfill Directive) or in a confined disposal facility in a special way. Despite the complex situation, there are presently no political activities in Germany to create a harmonised national guideline that regulates all aspects of DM handling.

5. Important legal questions

In exploring each others' regulatory frameworks as laid down in the previous chapter, the participants in DGE encountered a wide range of legal issues, in particular with regard to the transposition and interpretation of EU (waste) legislation. This chapter addresses these issues in the form "questions & answers". Clearly the overarching and challenging question is "When is 'dredged material' 'waste' and what are the consequences for the practice?"

5.1 Where and when does the term waste for dredged material during the dredging and transport operations apply and end?

Dutch considerations:

In the Dutch situation all dredged material is regarded as waste if there is a need for disposal. Based upon the quality, the dredged material is divided in classes. Class 0 is clean material (target-values are not exceeded). Class 1 and 2 are regarded as lightly polluted and classes 3 and 4 are heavily polluted. In general the Dutch Environmental Management Act forbids the disposal of waste outside a facility (WM art. 10.2). All waste should be disposed of in specific facilities like prescribed in the "decision on facilities and permits" (WM, Inrichtingen en vergunningenbesluit, Ivb). Facilities for the disposal of soils are mentioned in category 11 of the IVb, but since contaminated DM is regarded as industrial waste (bedrijfsafvalstof) facilities for contaminated dredged material are belonging to category 28 of appendix 1 of the IVb (facilities for the disposal of waste).

In the Environmental Management Act (WM) an exception on article 10.2 of the WM is made for DM of classes 0,1 and 2 (besluit vrijstelling stortverbod buiten inrichting, 1993 (1) Stb 616, revised 28-07-2000, staatsblad 2000, 352). Clean material (class 0) can be relocated in surface-waters without restrictions from an environmental point of view. DM of Classes 1 and 2, originating from maintenance dredging, can be relocated in - or alongside waterways within certain conditions.

Permits based upon the Pollution of Surface Waters Act are needed for relocation in waterways. For the excavation of contaminated DM a permit based upon the Soil Protection Act is needed also. In order to obtain both permits sediment (soil) quality has to be known. In this way before the dredging operation takes place the quality of the DM is known. This is necessary because the sediment quality (DM quality) determines indirectly if waste regulations or water or soil regulations apply to the dredging project. Transport of contaminated DM needs a permit based upon the provincial environmental ordinances.

The Dutch Building Materials Decree allows re-use DM of class 1, 2 or 3 as a secondary building material. Waste regulations allow this if the DM quality complies with the demands of the Building Materials Decree. During the use of DM as a building material the waste regulations is no longer relevant.

German considerations:

The issue of whether dredged material should be classified as waste and when the term should apply is based on the definition of waste in the Closed Substance Cycle and Waste Management Act (*Kreislaufwirtschafts- und Abfallgesetz* - KrW-/AbfG). Under Article 3 para. 1 of this Act, which corresponds with Article 1 a of the EC Framework Directive on Waste (Council Directive 75/442/EEC), waste is defined as "all movable property in the categories set out in Annex I which the holder discards, or intends or is required to discard".

In order for the term waste to apply to dredged material, the individual features of the definition must be met. There is no difficulty in classifying dredged material as a movable property, nor in

including it in the Annex I groups; the requirements of the Annex are met regular simply by applying its criteria Q1 and Q 16.

Ultimately, the deciding factor is whether one of the statements with regard to discarding can be applied. The "desire to discard", which must always be checked if movable property occurs unintentionally due to certain processing or treatment activities, is particularly significant. Pursuant to Article 3 para. 3 no. 1 of the KrW-/AbfG, "desire to discard" must be assumed in the case of property occurring in connection with certain treatment measures or services, when such occurrence is not the purpose of the action. Under Article 3, para. 3 no. 2, the desire to discard must also be assumed for such movable property whose original purpose no longer exists, or is given up, without being directly replaced by a new purpose.

Sediments from water bodies which are moved by dredging measures arise from natural processes and are an essential component of the water body as an ecological, hydrological and morphological system. The way they are moved and relocated elsewhere in the water body by natural processes is in principal the same as the way they are relocated to another point after displacement arising from anthropogenic activities to secure the navigational or hydrological function of the water body. This occurs, e.g. by dumping in the water column or hydrodynamic dredging; in relation to the water body, there are no fundamental differences between these two processes. In both cases the sediments stay in the water body, i.e. they remain where they occur naturally.

Since the extraction of dredged material is not the primary purpose of dredging in waterway, it could be assumed that there is a desire to discard in the sense of Article 3 para. 3 No. 1 of the KrW-/AbfG, when dredged material is relocated. It should be noted, however, that a particular measure can also have secondary objectives. Under the European Court of Justice (ECJ) ruling of 18 April 2002 (case C-9/00), the term waste and in particular the feature of discarding must be given a wide interpretation, and therefore stringent requirements have to be met in order for sediment to qualify as a by-product. Under this decision, the sediment could only be classed as a by-product if its environmentally sound re-use without prior processing and following directly on from the extraction process is certain. Uncertain, potential re-uses, or those only possible in the long-term, are not sufficient. Before dredging begins, therefore, and taking ecological aspects into account, it must be clear what role the relocated sediments will play in navigational safety, hydrology, morphology or water management.

By nature, sediments have an important function in the water body system. Each dynamic water body naturally tends towards a state of equilibrium in its solid matter budget. Suspended solids and bed load are transported according to the hydrological and hydraulical conditions in the water body, deposited as sediments and eroded (moved on, resuspended). As a rule, dredging for water body maintenance is planned and carried out with these natural processes in mind, i.e. the dredged sediments are relocated to a suitable point in the water body system. The location of sediments in the water can play a role in supporting the solid matter budget. The extraction of large quantities of sediments from the water body or continual abstraction of solid matter will result in changes to the water body bed, which can lead to considerable damage (e.g. destabilisation of hydraulic structures through erosion, adverse ecological effects) and to maintenance costs (e.g. addition of bed load). In this context, relocation within the water body system can be generally viewed as practical for morphological and ecological reasons, on the condition that the material is not significantly contaminated.

Where sediments must be defined as waste they are subject to the waste regime of the KrW-/AbfG. Under the obligations and requirements of this Act, priority must be given to the environmentally sound recovery of dredged material (cf Articles 5 ff KrW-/AbfG) or – if recovery is

not technically possible or economically reasonable (cf Article 5 para. 4 KrW-/AbfG) – dredged material must be disposed of in a manner compatible with public interest (cf Articles 10 ff KrW-/AbfG). The waste producer also has the option of recovery in water rather than recovery on land. The decisive factor is whether the material resources are used, or, as formulated in the ECJ decision of 27 February 2002 (case C-6/00), whether the dredged material can fulfill a useful task in the proposed recovery, which entails substituting the materials which must otherwise be used for this purpose and thus enabling conservation of natural resources. Here too, hydrological, morphological, water management and navigational safety aspects all play an important role in the technical assessment. Whether or not discarding dredged material classified as waste in water bodies can be seen as recovery must be decided on a case-by-case basis by the competent authorities on site.

As soon as wastes are discharged or dumped into water bodies, however, they are no longer subject to the provisions of the KrW-/AbfG (cf Article 2 para. 2, no. 6 KrW-/AbfG). However, all material and formal requirements of waste law apply without restriction until the moment the wastes are introduced into the water body.

The principle of waste avoidance has priority over waste management obligations (cf Article 4 para. 1, KrW-/AbfG). Before beginning the measure, therefore, a study must be undertaken to determine whether and to what extent it is possible to avoid or reduce wastes as defined under waste law.

The waste characteristic ends when a material obtained from dredged material is actually used in an environmentally sound way, or if a secondary raw material is produced of such a quality as would appear to ensure its environmentally sound use (e.g. pre-treated and purified sand as building material).

5.2 Is dredged material waste in the legal sense when it shall be relocated in waters?

Dutch considerations:

Yes. The Dutch definition of waste is in general the same as the definition of the European Waste Directive. However like explained in paragraph 4.1, the relocation of clean and lightly contaminated DM (waste) on banks of rivers and ditches or in surface waters is permitted with little restrictions from an environmental point of view. The permission will only be granted if the DM originates from maintenance dredging. The relocation of this waste material was made possible by means of a decree within the Environmental Management Act. In the next few years a new Dutch policy will be developed for re-use of DM as part of the soil.

German considerations:

Finally this is a case-by-case decision (see chap. 5.1).

Both the sediment transport dynamics and the possible transport of substances bound to the sediment and transported with it downstream the river into the sea require an integrated management of water bodies and sediments. If the material is introduced into a water system other than that from which it was dredged, it must be rated as waste; however, the required permit is issued pursuant to water legislation as indicated under §2, Section 6 KrW-/AbfG. Furthermore the requirements of waste legislation must be fulfilled.

5.3 What relevance has the Fauna-Flora-Habitat-Directive for the relocation of DM in waters? When has a dredging project to be classified as project with severe effects?

Dutch considerations:

Because of the Fauna-Flora-Habitat-Directive, member states should designate special protection (surface water) areas (SPAs). These areas together should form a European ecological network, the “Natura 2000 Network” and hence the areas are also known as “Natura 2000 sites”. In these sites the “precaution principle” (voorzorgsbeginsel) is in force. This means that the possibility that effects might occur is reason to assess the possible effects. Probably the impact of most dredging projects (especially if class 3 and 4 have to be dredged) on the protected area’s has to be assessed (even if the project will be executed outside the protected area). The assessed effects have to be judged according to article 6 of the directive. The project should not have significant effects. If significant effects occur, the project may only go on if:

- there are imperative reasons of ‘overriding public interest’;
- there is no alternative solution.

However in those cases the effects should be compensated in order to ensure that the protected area will keep it’s functionality. At the moment the terms *assessment of effects* and *significant effects* are not clarified in detail. Key species and natural habitats on which basis Dutch SPAs have been classified or yet designated are available, but the conservation objectives describing the ecological functionality remain to be established in many cases. The FFH Directive has been transposed into Dutch legislation (i.e. the “Flora en Faunawet”) as far as strictly protected animal and plant species are concerned (inside and outside SPAs). Transposition of the protection requirements regarding special protection areas is in preparation (i.e. into the new “Natuurbeschermingswet”).

German considerations:

The FFH Directive (92/43/EC of 21 May 1992) aims to enhance the ecological diversity in Europe. To this end, a coherent ecological network of areas under special protection should be established in Europe under the name "Natura 2000". Activities or measures, that may severely impair a recognized Nature-2000 area, must be checked for their compatibility with the conserving objectives defined for such areas. If this impact study finds that the protected area may be impaired in one or several of its elements that are essential for the conservation objectives or the protection function, the activity may be implemented only subject to the conditions mentioned in Article 6 Section 4 of the FFH Directive. In Germany, the FFH Directive was translated into national law by the 2nd Amendment of the Federal Nature Conservation Act (§§19 a-f BNatSchG).

According to the Federal Government's interpretation of the law, projects, that had been implemented already before the deadline for the translation of the FFH Directive into national law in June 1994, or for which at this time a formal permitting procedure had been initiated, are not subject to the regulations pursuant to Article 6 of the Directive. Their legal status remains unaffected. This applies also to repair and maintenance activities. As the relocation of DM on the whole constitutes one coherent process of maintenance work, its legal continuance is ensured by the above-mentioned principle, even if the quoted conditions exist.

5.4 What are the criteria to distinguish DM (EWC Code 17 05 06) and dredged material with hazardous substances (EWC Code 17 05 05)?

Dutch considerations:

The European Waste Catalogue - (EWC) was recently revised (by Council Decision 2000/532/EC of 3 May 2000) and DM is mentioned in waste code 17 05 (Soil and dredging spoil) differentiated in sub codes 17 05 05* (Dredging spoil containing dangerous substances) and 17 05 06 (Dredging spoil other than those mentioned in 17 05 05) which is implemented in the Dutch Environmental Management Act by means of the Eural directive. From 1 Mai 2002 the Dutch Eural directive came into force. In general the contaminant limits in the DM determine if the DM is hazardous waste or not. By means of the Dutch Eural directive the EC directives 2000/532/EC, 2001/118/EC, 2001/119/EC and 2001/573/EC have been implemented in the Dutch Environmental Management Act (see also paragraph 4.3.4).

German considerations:

The German ordinance on the European Waste Catalogue (AVV, 2001) says in §3, *Section 1*, 'Monitoring requirements for waste': "Hazardous waste marked by asterisk (*) in the waste catalogue requires monitoring in the sense of §41, *Section 1, Clause 1* and *Section 3, No. 1* of the Waste Act.

§3, *Section 2* AVV says that waste classified as hazardous is assumed to have one or several of the properties listed in Annex II to the Directive 91/689/EEC and - regarding the properties H3 to H8, H10, and H11 - has one or several of the characteristics mentioned in Section 2.

The aforementioned Annex II includes *inter alia* property H14 "ecotoxic: Substances and preparations which may pose direct or indirect hazards for one or several compartments of the environment."

The introduction of the annex to §2, *Section 1, No. 3* of the German ordinance on the European Waste Catalogue (AVV) reads:

"For the purposes of this ordinance "hazardous substance" means any substance that is rated as hazardous pursuant to the Ordinance on Hazardous Substances (*Gefahrstoffverordnung - GefStoffV*, 1999) or will be rated as such in the future; ..." [*GefStoffV*: §3 Definition of terms 99a: (1) hazardous substances in the sense of this ordinance are the substances, formulations, and products mentioned in the §19, *Section 2, No. 1 to 3* Chemicals Act (*Chemikaliengesetz*).

Regarding DM, this item needs clarification just like the description of the property H14 "ecotoxic" in order to avoid unrealistic, exaggerated consequences that threaten the functionality of ports and waterways.

5.5 What are the consequences in practice if DM is classified as dredged material with hazardous substances (EWC Code 17 05 05)?

Dutch considerations:

The consequences are that more restrictions will be inflicted on the handling of the DM (during excavation, transport and disposal). In some permits for CDF for DM in The Netherlands the acceptance of hazardous DM is permitted under the restriction that it has to be disposed in the centre of the CDF.

Disposal facilities specific for hazardous waste have much higher technical standards than facilities for non-hazardous waste. This will make disposal more expensive.

German considerations:

According to §6, Section 2 DepV (*German Landfill Ordinance*), wastes requiring special supervision (i.e. those marked with *) must be disposed of into a landfill of Class III and IV (underground disposal in salt mines). According to the definition of landfill class III (§2, No. 9 DepV) this waste contains a higher portion of contaminants than the material that may be disposed of into a landfill of Class II and which releases in leaching tests more contaminants than waste acceptable for landfills of Class II. However, the requirements on the structure and operation of the landfill are higher than those applicable to landfills of Class II." If waste requiring special supervision is classified as specific bulk waste (like dredged material, see DepV §2, No. 25a) and is disposed on a mono-disposal site, the competent authority can deviate from the usual demands (disposal criteria).

In the dumping on mono-disposal sites, when e.g. the high density of treated DM is intentionally used beneficially, the DM itself may already fulfill part of the safety precautions.

The specific characteristics of DM found consideration in the national implementation of the EU Landfill Directive. As a result DM is defined as a specific bulk waste which can be disposed of into mono-disposal-sites.

Moreover, for waste requiring special supervision a traceability procedure (documentation) is needed; exemptions are possible (§§43 ff. *KrW-/AbfG*). Details of this traceability procedure are regulated in the Ordinance on Waste Recovery and Disposal Records (*Nachweisverordnung-NachwV*); more details about monitoring and documentation on waste disposal sites are described in §§ 8 and 10 DepV.

Also the producers of waste requiring special supervision pursuant to §§19-21 *KrW-/AbfG* are obliged to keep records and establish balances, the details of which are regulated in the Ordinance on Waste Management Concepts and Waste Balances Sheets (*Abfallwirtschaftskonzept und -bilanzverordnung AbfKoBiV*).

Furthermore, §§49 and 50 *KrW-/AbfG* stipulate that the transport of waste requiring special supervision for recovery is subject to a transport permit. In the case of the transport of waste to landfill sites this applies to any kind of waste. In the case of waste re-use (for recovery) this applies for hazardous waste requiring special supervision only.

The confined disposal (landfill) of hazardous dredged material requires high technical demands and is consequently very expensive. Usually dredged material does not fulfill the criteria of hazardous waste (see definition of hazardous waste in Annex I).

5.6 Do we need waste permissions for the dredging and transportation equipment in the future?

Dutch considerations:

In The Netherlands permits are needed for the transportation of waste. Transportation of DM that will be relocated does not need such a permit. Regulations on this are part of the regional environmental ordinances (PMV). The Environmental Management Act enforces the regional authorities to make the ordinance (PMV) and also prescribes the general content of it.

The disposal facilities can also enforce specific measures during transport. Those measures often originate from the permit for a CDF, in which regulations are given on the acceptance procedure for the waste (DM) to be disposed in the facility.

German considerations:

No, as far as the waste legislation is not applicable for aquatic disposal (relocation).

Yes, if the DM is waste (see above). Permission is then necessary for the material, but not for the equipment.

5.7 EU and national waste regulations provide for on the subaquatic disposal of dredged material. How can this be dealt with from a legal point of view?

COUNCIL DIRECTIVE 1999/31/EC of 26 April 1999 on the landfill of waste states in Article 3 (Scope):

.... Without prejudice to existing Community legislation, the following shall be excluded from the scope of this Directive:

- the deposit of non-hazardous dredging sludges alongside small waterways from where they have been dredged out and of non-hazardous sludges in surface water including the bed and its sub soil ...

Dutch considerations:

The EC Landfill Directive (1999/31/ES) is relevant to disposal sites for DM on land only. In the Dutch point of view this does not mean that subaquatic disposal is prohibited. A confirmation to this point of view can be found more or less in Article 3 of the EC Landfill Directive. Article 3 states that the relocation of non-hazardous "dredging sludges" alongside waterways or in surface waters is excluded from the scope of the Directive. Also the Dutch definition of surface water is relevant to this question (Annex I). For example the CDF "IJsseloog" is situated in the lake Ketelmeer. However the water inside the facility (pit) is not surface water according to the Pollution of Surface Waters Act. The water in the pit is part of the facility because of the surrounding dike (protection of the surface water).

In The Netherlands a way was found to deal with this issue. The EU Landfill Directive was implemented in 2001 by means of the Ministerial Decision under the Environmental Management Act, for disposal facilities for non-hazardous DM on land (above groundwater). A directive for subaquatic disposal of DM is part of the policy document on the removal of DM (1993). In the Dutch point of view DM is a very specific kind of waste. Because of the specific properties (low permeability, low leaching under anaerobic conditions) of the DM, subaquatic disposal is possible without severe effects on the environment, including groundwater-quality. The Ministerial Decision on upland disposal and the Dutch directive for subaquatic disposal take the specific properties of the waste category DM into account. Specific isolative measures are not prescribed for disposal facilities for DM, but both documents define the maximum tolerable effects on the environment and especially on groundwater quality. Those definitions are in line with the Dutch Soil Protection Policy. The isolative measures that will be taken to ensure the protection of the environment can therefore be site-specific and differ between facilities. In this way the regula-

tions do not exclude the use of innovative isolative techniques. In general isolative measures must be taken to reduce emission of pollutants *As Far As Reasonably Achievable* (ALARA). However subaquatic disposal sites are only allowed if (amongst others) permits are issued based on the Environmental Management Act and the Pollution of Surface Waters Act (for the discharge of waste-water originating from the disposal facility on the surrounding surface water). Studies carried out in The Netherlands have even pointed out that, under certain conditions, disposal of contaminated DM directly in pits in surface waters is possible without intolerable effects on water quality.

German considerations:

In subaquatic (stationary) disposal, DM is placed below the water surface in such a way that no hazard to the environment occurs. The regulations of the commercial and industrial waste management act (*Kreislaufwirtschafts- und Abfallgesetz (KrW-/AbfG vom 27. September 1992)*) are pursuant to §2, Section 6 not applicable to substances if these are introduced or discharged into water bodies or wastewater facilities. Neither does the landfill ordinance (*DepV*) regulate the subaquatic disposal. Article 3 (2) of the European Landfill Directive expressly excludes subaquatic disposal of non-hazardous sludges.

Consequently, subaquatic, stationary disposal of DM is not governed by waste legislation, but by water and waterway legislation.

Many internationally available experiences, partly documented in PIANC reports show that - due to the specific properties of aquatic sediments - this special form of disposal at suitable sites is both economically and environmentally acceptable and is regulated outside waste legislation. It would be desirable to establish this disposal practice legally at the European level.

5.8 Dredged material mono disposal sites (including dewatering/flushing fields) may contain very low contaminated DM. These sites differ in their hazard and technical standards very much from typical waste landfills. Do we need to define standards for DM disposal sites under the waste legislation?

Dutch considerations:

In The Netherlands two ways of storage of DM are distinguished:

1. A facility meant for permanent disposal;
2. A facility meant to store DM temporary (maximum of 3 years) such as dewatering fields.

In the regulations for both cases the specific properties of DM are taken into account (see also the answer to question 5.7). Within the Environmental Management Act, facilities meant to store DM temporary are regarded as facilities for treatment of DM. The regulations for such facilities for treatment differ from the regulations for facilities for the permanent disposal of DM.

German considerations:

The German situation is comparable to the Dutch situation. The German Landfill Ordinance applies to permanent disposal irrespective of the degree of contamination except temporary disposal less than 3 years. For temporary disposal up to 3 years other legislation applies (e.g. construction law, BImSchG).

5.9 Preamble 4 of the EU landfill directive points out that the treatment of dredged sludge from waterways still has to be clarified. Has this been done at a national level? (note: sludge is not a suitable term for DM; see chap. 3)

Dutch considerations:

At the moment the treatment of DM is under study again in The Netherlands and taken into consideration again for contaminated DM. Results of pilot projects could lead to the conclusion that more DM has to be treated instead of being disposed of in facilities.

The requirements of the European waste policy that the creation of waste should be avoided and the beneficial re-use should be stimulated are implemented in the Dutch waste policy by means of the Act on Environmental Taxes. Starting in 2002, the Act on Environmental Taxes applies to the waste category contaminated DM too. The act is regarded as an instrument to reduce the amount of contaminated DM that has to be disposed of in facilities (CDF). If contaminated DM has a sand content of 60% or more (criteria for treatment), as mentioned in the Act on Environmental Taxes, the material has to be treated (sand separation) or taxes have to be paid if this material is to be disposed of directly in a facility. In this way the costs of disposal (for certain amounts of contaminated DM) increase and will be closer to the costs of treatment. Administrative procedures were developed for the execution of the Act. In general Dutch water managers are afraid that the Act will obstruct the execution of dredging projects because of the increasing costs for disposal. Therefore a monitoring programme was made to evaluate if the aims of the Act will be fulfilled, but also to make sure that the Act will not work counter productive for the necessary maintenance- and remedial dredging projects. The relocation of DM into the North Sea is already excluded from the scope of the Act in order to ensure that this activity will not obstruct this. Also DM originating from projects that are meant to increase safety against flooding, (widening of the riverbed for example) is excluded from the scope of the Act, but only if the DM is disposed of within the project area. However, those projects have to be appointed by the Minister of Environment.

As another instrument to stimulate treatment of contaminated DM a (temporal) provision is in preparation to subsidize more sophisticated treatment techniques (see DGE document Part II "Treatment and Confined Disposal of DM").

German considerations:

The term "treatment" in the preamble means in the wider sense the handling of DM. However, Article 3 (h) of the EU Landfill Directive defines "treatment" as: "physical, thermal, chemical, or biological methods, including sorting, which alter the constitution of the waste in order to reduce its volume or its hazardous properties, to facilitate its handling or its beneficial use."

Further clarification has not been achieved in Germany yet. With view to the importance of ports and waterways, the long-term objective should be the formulation of a European regulation for the handling of sediments in which all aspects of handling find consideration. A first reasonable step in this regard is the national harmonisation between Federal authorities and Federal States in Germany and a discussion in the context of the Dutch-German Exchange on DM. Further discussions should follow within the European network SedNet.

5.10 Will be waste management plans/concepts for DM obligatory in future – also in The Netherlands - if DM is waste?

Dutch considerations:

In The Netherlands waste-management plans are in use for different waste materials. The Environmental Management Act makes the use of such waste management plans mandatory for regional authorities. However such plans are not in use for DM. It is not expected that waste management plans for DM will be obligatory in the near future. For DM the Governmental Decision on the removal of DM (BVB, 1993) can be seen as a national waste management plan. On national scale, different scenarios for the handling (dredging, transport, treatment, re-use, disposal) of DM were recently investigated by means of the project “Tienjarensscenario”. On local scale, for remediation dredging projects remediation plans are made and have to be approved by the regional authorities. In order to get the approvals it must be made clear how, where and when the material will be dredged and also what the destination will be for the DM.

German considerations:

The obligation to formulate waste management plans/concepts/and balances above certain quantitative waste thresholds originates in Germany from §§29, 19 and 20 KrW-/AbfG. Detailed requirements are regulated by the "Ordinance on Waste Management Concepts and Waste Balances Sheets" of 13 September 1996. DM that is regarded as waste has to meet the demands of the ordinance mentioned above.

6. Outlook

Evidently, DM is on the borderline of water, soil and waste policies, of which the last one has well-developed international dimensions. EU water policy will face further integration with the implementation of the Water Framework Directive (WFD) that requires description and approach of water management problems on river basin scale. Although DM and sediment do not play an eminent role in the WFD and its supplementary regulations and guidelines, sediment quality is an inherent part of the ecological quality of water systems. Therefore DGE welcomes the recent establishment of the EU Sediment Network (SedNet) under the terms of the 5th Framework Programme for RTD – which has as an objective to develop guidelines for sediment management on a river basin scale. As a first contribution to this objective, DGE will make its results available to the relevant SedNet working groups (on issues as evaluation, treatment and decision-making).

Furthermore, an EU policy on soil protection is in an early stage of development. In an initial discussion about an EC Soil Communication in May 2002, various Member States stressed the importance of exploring the relationship with the Water Framework Directive and DM in particular. Information from DGE might be helpful in this framework.

Conversely, discussions on sediment/DM issues in sediment, EU-soil and EU-water frameworks may give rise to new initiatives for investigation, analysis or development. The participants in DGE could offer resources for such initiatives and make use of the DGE bilateral network that is already in place.

TERM – BEGRIFF -	EXISTING INTERNATIONAL DEFINITIONS	EXISTING GERMAN DEFINITIONS	EXISTING DUTCH DEFINITIONS
I. Definitions for Dredged Material/Soil/Waste and related terms etc.			
Dredged material – Baggergut	<p><u>PIANC ENVICOM 3 (2000):</u> Material excavated from waters. The term dredged material refers to material which has been dredged usually from the bed of a water body, while the term sediment refers to material in a water body prior to the dredging process.</p> <p><u>PIANC ENVICOM 5 (2002):</u> The term 'dredged material' refers to material that has been dredged from a water body, while the term sediment refers to material in a water body prior to the dredging process.</p> <p><u>DMAF (London Convention):</u> 1.1The greater proportion of the total amount of material dredged world-wide is, by nature, similar to undisturbed sediments in inland and coastal waters. A smaller proportion of dredged material, however, is contaminated by human activity to an extent that major environmental constraints need to be applied when depositing these sediments.</p> <p><u>OSPAR – Dredged Material Guideline:</u> 2.3 In the context of these guidelines, dredged materials are deemed to be sediments or rocks with associated water, organic matter etc. removed from areas that are normally or regularly covered by water, using dredging or other excavation equipment.</p>	<p><u>DIN 19731 Re-use of soil material (1998)/ HABAB-WSV (2000):</u> Soil material that is removed from water bodies in the process of maintenance-, capital-, and developmental dredging. Dredged material may consist of</p> <ul style="list-style-type: none"> - sediments and sub-hydric soils from the bottom of waters; - soils and their parent materials in the immediate vicinity of the water bed; or - top soils of the banks and the floodplain. <p><u>ATV-M362, Part 1 (1997):</u> Dredged material is the designation for soil, soil material, or excavated soil occurring in the processes of the maintenance of waters or their development for ensuring the safety and ease of navigation and the flow of water. This involves</p> <ul style="list-style-type: none"> - on the one hand, wet dredged material, i.e. sediments from the bottoms of waters and earth from below the groundwater surface in the vicinity of the water body; - on the other hand, dry material, i.e. material from non- or only partially water-saturated soil layers of the bank zones. 	<p><u>“Directive for facilities for the disposal of dredged material on land” (Regeling stortplaatsen voor baggerspecie op land, 2001):</u> Dredged material: Dredged aquatic soils. However the following materials are exempted from this definition:</p> <ul style="list-style-type: none"> a. Objects that are separately removed out of the aquatic soils. b. Aquatic soils which are excavated for use as a base material. c. Aquatic soils which are not removed from the soil via the surface water or the space meant for the storage of surface waters. d. Dredged material that has been dewatered or ripened for (beneficial) re-use based upon the regulations of the Building Materials Decree e. Substances and products that originate from treatment or use of dredged material, excluding the residu of treatment processes. <p><u>Act on Environmental Taxes (2001):</u> Dredged material: Soil-material (grond) that is removed from the soil via the surface water or the space meant for</p>

TERM – BEGRIFF -	EXISTING INTERNATIONAL DEFINITIONS	EXISTING GERMAN DEFINITIONS	EXISTING DUTCH DEFINITIONS
	<p><u>ISO/CD 11074-3 (soil quality):</u> Materials excavated during e.g. maintenance, construction, reconstruction and extension measures from waters Note: Dredged material may consist of:</p> <ul style="list-style-type: none"> ▪ Sediments or subhydric soils ▪ Soils and their parent material beneath the surface water body 	<p><u>HTG-FA Dredged Material (2002):</u> Dredged material is soil, soil material, or excavated soil containing varying portions of mineral and organic materials occurring in the processes of maintenance of waters or their development for ensuring the safety and ease of navigation and the flow of water. [The definition is tailored especially to purposes of hydraulic engineering and water-resources management and is oriented at the definitions given in DIN 19731 and by ATV.]</p>	the storage of surface waters.
(Bottom) Sediment – Gewässersediment	<p><u>PIANC ENVICOM 3 (2000):</u> Solid fragmental material originating from weathering of rocks or by other processes and transported or deposited by air, water or ice, or that accumulated by other processes such as chemical precipitation from solution or secretion by organisms. The term is usually applied to material held in suspension in water or recently deposited from suspension and to all kinds of deposits, essentially of unconsolidated materials.</p> <p><u>PIANC ENVICOM 5 (2002):</u> Material, such as sand, silt, or clay, suspended in or settled on the bottom of a water body. Sediment input to a body of water comes from natural sources, such as erosion of soils and weathering of rock, or as the result of anthropogenic activities, such as forest or agricultural practices, or construction activities. The term 'dredged material' refers to material that has been</p>	<p><u>DIN 4049 Part 1 (Hydrology):</u> Deposited (water) constituents.</p>	-

TERM – BEGRIFF -	EXISTING INTERNATIONAL DEFINITIONS	EXISTING GERMAN DEFINITIONS	EXISTING DUTCH DEFINITIONS
	dredged from a water body, while the term sediment refers to material in a water body prior to the dredging process.		
Contaminated dredged material/sediments – Kontaminiertes Baggergut/Sediment	<p><u>PIANC ENVICOM 3 (2000):</u> Sediments or materials that have unacceptable level of contaminant(s); that have been demonstrated to cause an unacceptable adverse effect on human health or the environment.</p> <p><u>PIANC ENVICOM 5 (2002):</u> Any sediment that is removed by dredging and that contains contaminants at levels and availability that can make the material environmentally unacceptable for unrestricted use.</p>		<p><u>Act on Environmental Taxes 2001 (Wbm):</u> Contaminated dredged material = All dredged material not belonging to class 0. Dredged material class 0 is defined as dredged material in which the target values for contaminants are not exceeded.</p>
Suspended matter - Schwebstoff	<p><u>PIANC ENVICOM 3 (2000):</u> The part of the sediment load that is in suspension.</p>	<p><u>DIN 4049 Part 3 (Hydrology):</u> Solids kept in suspension by the equilibrium of vertical forces.</p>	
Wash load		<p><u>DIN 4049 Part 3 (Hydrology):</u> Fine-grained portion of suspended solids in flowing waters, not originating from the bottom of the watercourse reach under consideration.</p>	
Bed load – Geschiebe	<p><u>PIANC ENVICOM 3 (2000):</u> The quantity of sediment transported by a current. It includes the suspended load of small and large particles that move along the bottom.</p>	<p><u>DIN 4049 Part 3 (Hydrology):</u> Solids that are transported exclusively near the bottoms of watercourses.</p>	

TERM – BEGRIFF -	EXISTING INTERNATIONAL DEFINITIONS	EXISTING GERMAN DEFINITIONS	EXISTING DUTCH DEFINITIONS
Soil - Boden	<p><u>ISO 11074-1 (soil quality):</u> Upper layer of earth's crust composed of mineral parts, organic substance, water, air, and living matter.</p>	<p><u>Soil Protection Act - BBodSchG §2:</u> (1) Soil in the sense of this Act is the uppermost layer of the earth's crust as far as it performs the soil functions mentioned in Section 2, including the liquid components (soil solution) and the gaseous components (soil air), without groundwater and beds of water bodies.</p> <p><u>DIN 19731 Recovery of soil material (1998):</u> The uppermost layer of the earth's crust consisting of mineral particles, organic substance, water, air, and living organisms.</p>	<p><u>Soil protection Act:</u> (text 1998 was used), Soil = the firm part of the earth with the liquid and gaseous components and organisms contained therein.</p>
Top Soil – Oberboden/ Mutterboden	<p><u>ISO/CD 11074-3 (soil quality):</u> Upper part of a natural soil that is generally dark coloured and has a higher content of organic substances and nutrients when compared to the subsoil below.</p>	<p><u>DIN 19731 Recovery of soil material (1998):</u> The uppermost layer of the mineral soil (<i>solum</i>) which contains a portion of humus and soil organisms in dependence on its genesis, distinguished from lower soil layers by its darker colour; usually Ah horizon, Aa horizon, Ap horizon, and the O horizons [DIN 4047-3].</p>	
Soil Material – Bodenmaterial	<p><u>ISO/CD 11074-3 (soil quality):</u> Soil material includes excavated soil, dredged materials, manufactured soils, and treated soils and fill materials.</p>	<p><u>Soil Protection Act - BBodSch V §2:</u> Material from soils in the sense of §2 Section 1 of the Federal Soil Protection Act and their parent materials including top soil, that is excavated, shoved aside, or treated in the process of construction activities or other modifications of the earth's surface.</p> <p><u>DIN 19731 Recovery of soil material (1998):</u> Material originating from soils or their parent materials. Remark: This refers to excavated soil or dredged material.</p>	<p><u>Building Materials Decree :</u> Definitie grond Soil material (grond) = non shaped building material with a fixed structure, which has a natural origin, is not produced by man, and can be part of the Dutch soil. (niet-vormgegeven bouwstof met een vaste structuur, die van natuurlijke oorspong is, niet door de mens geproduceerd en onderdeel van de Nederlandse bodem kann uitmaken)</p>

TERM – BEGRIFF -	EXISTING INTERNATIONAL DEFINITIONS	EXISTING GERMAN DEFINITIONS	EXISTING DUTCH DEFINITIONS
Excavated Soil Material - Bodenaushub	<u>ISO/CD 11074-3 (soil quality):</u> Any natural material excavated from the ground, including topsoil, subsoil, altered parent rock and parent rock itself, typically arising during construction works.	<u>DIN 19731 Recovery of soil material (1998):</u> Soil material occurring in maintenance, new-construction and development works in the terrestrial zone.	
Waste - Abfall	<u>75/442/EE EC Framework Directive on Waste, Article 1:</u> For the purposes of this Directive: (a) "waste" shall mean any substance or object in the categories set out in Annex I which the holder discards or intends or is required to discard. The Commission, acting in accordance with the procedure laid down in Article 18, will draw up, not later than 1 April 1993, a list of wastes belonging to the categories listed in Annex I. This list will be periodically reviewed and, if necessary, revised by the same procedure;	<u>(German) Closed Substance Cycle and Waste Management Act - KrW-/AbfG § 3 (1):</u> For the purpose of this Act, "waste" shall mean all movable property in the categories set out in Annex I which the holder discards, or intends or is required to discard. "Waste for recovery" is waste that is recovered; waste that is not recovered is "waste for disposal".	<u>Environmental Protection Act:</u> Waste = All substances or products the withholder/producer wants to dispose.
Inert waste - Inertabfall	<u>1999/31/EC on the landfill of waste (Article 2 e):</u> For the purposes of this Directive: "inert waste" means waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant, and in particular not endanger the quality of surface water and/or groundwater;	<u>(German) Closed Substance Cycle and Waste Management Act - KrW-/AbfG § 3 (11):</u> Inert wastes are mineral wastes that do not undergo essential physical, chemical, or biological changes, that are non-flammable and do not react otherwise physically or chemically, that are not biodegradable and do not impair other material with which they come into contact in a manner that may have detrimental impacts on the environment or human health. The total leaching potential and the contaminant content of wastes and the toxicity of the leachate must be insignificant and, in particular, must not pose any threat to the quality of surface water or groundwater. The Federal	<u>Environmental protection Act:</u> Dutch definition is in general the same as the European and German definition.

TERM – BEGRIFF -	EXISTING INTERNATIONAL DEFINITIONS	EXISTING GERMAN DEFINITIONS	EXISTING DUTCH DEFINITIONS
		Government is empowered to define inert wastes by legal regulations following consultations with those concerned (§60) and with the consent of the <i>Bundesrat</i> (Council of Constituent States).	
Hazardous waste – gefährlicher Abfall	<p><u>91/689/EEC on hazardous waste (Article 1, 4.):</u> For the purpose of this Directive hazardous waste means:</p> <ul style="list-style-type: none"> - wastes featuring on a list to be drawn up in accordance with the procedure laid down in Article 18 of Directive 75/442/EEC on the basis of Annexes I and II to this Directive, not later than six months before the date of implementation of this Directive. These wastes must have one or more of the properties listed in Annex II. The list shall take into account the origin and composition of the waste and, where necessary, limit values of concentration. This list shall be periodically reviewed and if necessary revised by the same procedure, - any other waste which is considered by a Member State to display any of the properties listed in Annex II. <p>Such cases shall be notified to the Commission and reviewed in accordance with the procedure laid down in Article 18 of Directive 75/442/EEC with a view to adaptation of the list.</p> <p><u>2000/532/EC European Waste Catalogue, Article 2:</u> Wastes classified as hazardous are consid-</p>	<p><u>Ordinance on the Implementation of the European Waste List §3 (2):</u> Wastes classified as hazardous are considered to display one or more of the properties listed in Annex II to Directive 91/689/EEC of 12. December 1991 about hazardous waste (Abl. EG No. L 377 p. 20) and, as regards H3 to H8, H10(6) and H11 of that Annex, one or more of the following:</p> <ol style="list-style-type: none"> 1 flash point $\leq 55^{\circ}\text{C}$, 2 one or more substances classified (7) as very toxic at a total concentration $> 0,1\%$, 3 one or more substances classified as toxic at a total concentration $\geq 3\%$, 4 one or more substances classified as harmful at a total concentration $\geq 25\%$, 5 one or more corrosive substances classified as R35 at a total concentration $\geq 1\%$, 6 one or more corrosive substances classified as R34 at a total concentration $\geq 5\%$, 7 one or more irritant substances classified as R41 at a total concentration $\geq 10\%$, 8 one or more irritant substances classified as R36, R37, R38 at a total con- 	<p><u>EURAL 2002 (Circulaire EURAL):</u> Hazardous waste is defined in the EURAL “directive” as “Waste containing hazardous substances”</p>

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	<p>ered to display one or more of the properties listed in Annex III to Directive 91/689/EEC and, as regards H3 to H8, H10(6) and H11 of that Annex, one or more of the following:</p> <ol style="list-style-type: none"> 1 Flash point $\leq 55^{\circ}\text{C}$, 2 one or more substances classified(7) as very toxic at a total concentration $\geq 0,1\%$, 3 one or more substances classified as toxic at a total concentration $\geq 3\%$, 4 one or more substances classified as harmful at a total concentration $\geq 25\%$, 5 one or more corrosive substances classified as R35 at a total concentration $\geq 1\%$, 6 one or more corrosive substances classified as R34 at a total concentration $\geq 5\%$, 7 one or more irritant substances classified as R41 at a total concentration $\geq 10\%$, 8 one or more irritant substances classified as R36, R37, R38 at a total concentration $\geq 20\%$, 9 one or more substances known to be carcinogenic of category 1 or 2 at a total concentration $\geq 0,1\%$, 10 one or more substances toxic for reproduction of category 1 or 2 classified as R60, R61 at a total concentration $\geq 0,5\%$, 11 one or more substances toxic for reproduction of category 3 classified as R62, R63 at a total concentration $\geq 5\%$, 	<p>centration $\geq 20\%$,</p> <ol style="list-style-type: none"> 9 one or more substances known to be carcinogenic of category 1 or 2 at a total concentration $\geq 0,1\%$, 10 one or more substances known to be carcinogenic of category 3 at a total concentration $\geq 1\%$, 11 one or more substances toxic for reproduction of category 1 or 2 classified as R60, R61 at a total concentration $\geq 0,5\%$, 12 one or more substances toxic for reproduction of category 3 classified as R62, R63 at a total concentration $\geq 5\%$, 13 one or more mutagenic substances of category 1 or 2 classified as R46 at a total concentration $\geq 0,1\%$, 14 one or more mutagenic substances of category 3 classified as R40 at a total concentration $\geq 1\%$. <p>Waste code:</p> <p>17 05 Soil (including excavated material from contaminated sites), rocks, dredged material</p> <p>17 05 05* Dredged material that contains hazardous substances</p> <p>17 05 06 Dredged material, except that mentioned under 17 05 05</p>	

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	<p>12 one or more mutagenic substances of category 1 or 2 classified as R46 at a total concentration $\geq 0,1$ %,</p> <p>13 one or more mutagenic substances of category 3 classified as R40 at a total concentration ≥ 1 %.</p>		
II. Important terms and definitions from Water-Legislation and Hydrology			
Surface water – oberirdisches Gewässer	<p><u>2000/60/EC Water Framework Directive (Article 2):</u></p> <p>"Surface water" means inland waters, except groundwater; transitional waters and coastal waters, except in respect of chemical status for which it shall also include territorial waters.</p>	<p><u>Federal Water Act - WHG §1:</u></p> <p>Water flowing continuously or temporarily in beds or being stagnant or flowing uncontrolledly from springs (surface waters).</p> <p><u>DIN 4049 Part 1 (Hydrology):</u></p> <p>Flowing or stagnant water in nature, including beds of water bodies and aquifers.</p> <p><u>HTG-FA Dredged Material (2002):</u></p> <p>Water bodies are the coastal waters and surface waters mentioned in the Federal Water Act (<i>WHG</i>), the limits of which are described in the Waterways Act (<i>WaStrG</i>) by MThW for tidal coastal waters and by MW for coastal waters without tidal influence and in the Federal Water Act (<i>WHG</i>) and the Water Legislation of the Federal States by MW for surface waters without tidal influence. The term water body comprises the bed as well as the bottom.</p>	<p><u>Water Protection Act (1970):</u></p> <p>In the Dutch situation the definition of surface waters is very important regarding the definition of Dredged Material. The definition of surface-waters is on purpose not given in the water protection act (WVO) in order to prevent that a narrow definition would restrict the effectiveness of the act. As a result there is a lot of jurisprudence on this aspect, which has led to the following broad definition for surface waters (1982):</p> <p>“A, not incidental, mass of water (including the waterbed in which the water is temporarily present) bordering the surface of the earth and the air, unless no normal ecosystem is present in the water as a result of legal use for a specific goal (depot Ijsseloo e.g.)”</p> <p>Aquatic soils are defined in the Soil Protection Act (SPA, <i>NL/Wbb</i>). The definition is as follows:</p> <p>“soils present underneath surface waters”</p>

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Water bottom (river channel)- Gewässerbett		<u>DIN 4049 Part 3 (Hydrology):</u> Natural or artificial depressions or impounding structures of the land surface belonging to surface water bodies. Remark: The floodplain is not part of the bed.	<u>Soil Protection Act:</u> Aquatic soil (waterbodem) is defined as soils underneath surface waters. This definition includes “das Überschwemmungsgebiet”. Also the terms “zomerbed” and “winterbed” can be relevant here. Those terms often are used to border the regions for different water-authorities. In general the winterbed can be seen as the “Überschwemmungsgebiet”.
Inland water – Binnengewässer	<u>2000/60/EC Water Framework Directive (Article 2):</u> "Inland water" means all standing or flowing water on the surface of the land, and all groundwater on the landward side of the baseline from which the breadth of territorial waters is measured.	<u>DIN 4049 Part 3 (Hydrology):</u> Surface water landwards of coastal waters.	
Coastal water- Küstengewässer	<u>2000/60/EC Water Framework Directive (Article 2):</u> "Coastal water" means surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters.	<u>Federal Water Act - WHG §1:</u> The sea between the coastline at mean high water or the seaward limit of surface waters and the seaward limit of the coastal sea. <u>DIN 4049 Part 3 (Hydrology):</u> Waters between the shoreline on the mainland coast or the seaward limit of the surface waters, on the one hand, and the limit of the territorial waters (boundary of the high sea), on the other hand.	
Freshwater limit – Süßwassergrenze	<u>OSPAR Convention 1992 (Article 1c):</u> "Freshwater limit" means the place in a watercourse where, at low tide and in a period of low freshwater flow, there is an	<u>DIN 4049 Part 2 (Hydrology):</u> Freshwater is water with a low concentration of dissolved salts. Depending on the point of view and use interests, the distinction from	

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	appreciable increase in salinity due to the presence of seawater.	<p>saltwater may vary.</p> <p>Saltwater is water with a high concentration of dissolved salts, mainly sodium chloride. Depending on the point of view and use interests, the distinctive criteria may differ, e.g.:</p> <ul style="list-style-type: none"> - total concentration of dissolved salts >5 g/l - chloride concentration > 1 g/l (salty taste) 	
Heavily modified water body – Künstlich stark veränderter Wasserkörper	<p><u>2000/60/EC Water Framework Directive (Article 2):</u></p> <p>"Heavily modified water body"</p> <p>means a body of surface water which as a result of physical alterations by human activity is substantially changed in character, as designated by the Member State in accordance with the provisions of Annex I.</p>		
(Federal, Regional) Waterway – Wasserstraße		<p><u>Federal Waterway Act - WaStrG §1:</u></p> <p>(1) Pursuant to this Act, Federal waterways are</p> <p>1. The inland waterways owned by the Federal Government that serve for general navigation; these are the waterways listed in the Annex to this Act; including also all parts of water bodies which</p> <ul style="list-style-type: none"> a) must be seen in their appearance to form a natural entity with the Federal waterway, b) are connected with the Federal waterway by one inflow or outflow of water, c) allow navigation to and from the Federal waterway; 	

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		<p>d) are owned by the Federal Government,</p> <p>(2) Marine waterways are the areas between the coastline at mean high water or the seaward limit of the inland waterways and the seaward limit of the coastal sea. Marine waterways do not include harbour approaches that are flanked on one or both sides by guiding walls or jetties, the outer deeps, built structures for coastal defence, drainage or land reclamation, bathing facilities, and the dry-falling bathing beach.</p>	
Water system – Gewässerregime		<p><u>HTG-FA Dredged Material (2002):</u> A water system is a system of waters governed by specific characteristics. These are essentially determined by its hydrological, morphological and sedimentological behaviour.</p>	In general the same as the German definition
III. Specific terms and definitions from the dredged material management			
Dredged material handling – Umgang mit Baggergut	<p><u>DGE - Dutch-German Exchange on dredged material (2002):</u> handling comprises in the broadest all possible steps being undertaken with the dredged material from the beginning to the end of a dredging project.</p>		

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Processing – Behandlung (see → Treatment)	<u>DGE - Dutch-German Exchange on dredged material (2002):</u> processing expresses that the material has been treated technically within the handling chain. Handling may include treatment.		
III-1. The dredging process			
Dredging – Baggern (Aufnahme)	<u>PIANC ENVICOM 3 (2000):</u> Dredging refers to loosening and lifting earth and sand from the bottom of water bodies. Dredging is often carried out to widen the stream of a river, deepen a harbour or navigational channel, or collect earth and sand for landfill; it is also carried out to remove contaminated bottom deposit or sludge to improve water quality.	<u>HTG-FA Dredged Material (2002):</u> Dredging is the technical activity of uptaking and conveying dredged material.	
Building activity/construction works - Baumaßnahme	<u>ISO/CD 11074-3 (soil quality):</u> Earthworks (e.g. embankments), landscape engineering, road construction, construction of waste disposal sites, and backfilling of excavated sites or mines (i.e. applications where soil materials are not required to have a direct productive use – although they may have support other layers intended to have a productive use).	<u>DIN 19731 Recovery of soil material (1998):</u> Construction works in the widest sense, e.g. earthwork, road construction, landscaping, landfill construction, as well as backfilling of excavations or raw-material mines.	<u>Building Materials Decree:</u> Building constructions (werken) are defined in art 1a as: “grondwerk, wegenbouwkundig werk, waterbouwkundig werk of bouwwerk”
Maintenance dredging – Unterhaltungs-			Dredging for maintenance purposes. This definition is important because of the

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baggerung			specific rules for the relocation of class 0,1 and 2 dredged material. An exemption was made in the <u>Environmental Protection Act</u> for dredged material of classes 0,1, and 2, originating from maintenance dredging. Disposal of this material doesn't have to take place in facilities. This means that this dredged material can be relocated into the water-system (within certain conditions).
Capital dredging – Ausbaubaggerung (Investitionsbaggerung)	<u>PIANC PTC I-17 (1996):</u> Dredging in ports and inland waterways to remove sediment - to maintain navigational channels, - to extend or deepen the facilities		
Remedial dredging – Sanierungs-baggerung	<u>PIANC PTC I-17 (1996):</u> Dredging in ports and inland waterways is the removal of the sediment - to maintain channels and - to remove pollution.		<u>Soil Protection Act:</u> Remediation = the limitation and as far as possible the elimination of contamination and the direct consequences thereof or the danger of the contamination of the soil.
III-2. Transport of dredged material			
Transport – Transport		<u>HTG-FA Dredged material (2002):</u> Transport is the conveyance of dredged material from the dredging site to the placement site.	
III-3. Disposal of dredged material			
Disposal – Beseitigen	<u>EC Framework Directive on Waste, Article 1:</u> For the purposes of this Directive:	<u>HTG-FA Dredged material (2002):</u> Disposal is a technical measure for "accommodating or placing" the dredged	<u>“Directive for facilities for the disposal of non hazardous dredged material on land” (Regeling stortplaatsen voor</u>

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<p><u>note:</u> The meaning of "disposal" in this DGE-document is broader than the definition in the EC Waste Framework Directive (see chap. 3).</p>	<p>(e) "disposal" shall mean any of the operations provided for in Annex IIA; ANNEX IIA: DISPOSAL OPERATIONS This Annex is intended to list disposal operations such as they occur in practice. In accordance with Article 4 waste must be disposed of without endangering human health and without the use of processes or methods likely to harm the environment.</p> <ul style="list-style-type: none"> ▪ D 1 Deposit into or onto land (e.g. landfill, etc.) ▪ D 2 Land treatment (e.g. biodegradation of liquid or sludgy discards in soils, etc.) ▪ D 3 Deep injection (e.g. injection of pumpable discards into wells, salt domes or naturally occurring repositories, etc.) ▪ D 4 Surface impoundment (e.g. placement of liquid or sludgy discards into pits, ponds or lagoons, etc.) ▪ D 5 Specially engineered landfill (e.g. placement into lined discrete cells which are capped and isolated from one another and the environment, etc.) ▪ D 6 Release into a water body except seas/oceans ▪ D 7 Release into seas/oceans including sea-bed insertion ▪ D 8 Biological treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the 	<p>material in waters or on land. It may be temporarily limited or final storage. Disposal is the third necessary step in the process chain following dredging (uptake) and transport. Disposal may be stationary or instationary, in waters or on land, confined or unconfined. Disposal is a general term that comprises several of the terms mentioned herebelow.</p>	<p><u>baggerspecie op land, 2001):</u> Disposal of DM: The placing of waste-materials, with or without packaging materials, in or on the soil, with the intention to leave the waste materials in that place.</p>

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	<p>operations numbered D 1 to D 12</p> <ul style="list-style-type: none"> ▪ D 9 Physico-chemical treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations numbered D 1 to D 12 (e.g. evaporation, drying, calcination, etc.) ▪ D 10 Incineration on land ▪ D 11 Incineration at sea ▪ D 12 Permanent storage (e.g. emplacement of containers in a mine, etc.) ▪ D 13 Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 ▪ D 14 Repackaging prior to submission to any of the operations numbered D 1 to D 13 ▪ D 15 Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage, pending collection, on the site where it is produced) 		
III-3.1. Aquatic Disposal – terms and definitions			
Aquatic disposal/ placement – Ablagerung im Wasser	<p><u>PIANC ENVICOM WG 1:</u> Placement of dredged material in water bodies including navigable and non-navigable waters, small lakes, lagoons and rivers (Types 1 - 8 in Fig. 1.1). Contained disposal on land is excluded (Type 9).</p>	<p><u>HABAB-WSV (2000):</u> Aquatic disposal/placement means the disposal of dredged material within the lateral confines of the Federal waterways. The lateral confines of the Federal waterways are defined by the water legislation of the</p>	<p>The Governmental decision on the removal of dredged material (1993) contains a directive for large scale disposal facilities for Dredged Material. Aquatic disposal is disposal beneath the (ground)waterlevel.</p>

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	<p>There are many variations, some of which include recovery. Lateral containment (e.g. placement of dredged materials in bottom depressions or behind subaqueous berms) in combination with capping is defined as contained (or confined) aquatic disposal.</p> <p><u>OSPAR Convention 1992 (Article1):</u> (g)"Dumping" does not include: ii. placement of matter for a purpose other than the mere disposal thereof, provided that, if the placement is for a purpose other than that for which the matter was originally designed or constructed, it is in accordance with the relevant provisions of the Convention.</p> <p><u>PIANC ENVICOM WG 3:</u> Comprises all dredged material placement options under which the dredged material is submerged under water and remains water-saturated after placement terminates. (Differs from open-water dredged material placement. Open-water dredged material placement does not specify placed material be submerged and remain saturated).</p> <p><u>Consider:</u> The most important method for the maintenance of waterways is the unrestricted open water disposal of dredged material. The term dumping which is used for waste disposal in international conventions (LC, OSPAR) should not be used for (clean)</p>	<p>Federal States and §1 of the Federal Waterways Act (<i>WaStrG</i>).</p> <p>A spatial connection between dredging site and placement site is not relevant in this regard.</p> <p>Neither is purposefulness required for the notion of aquatic disposal/placement. For instance, the following activities are included in the notion of aquatic disposal/placement: Dumping in the water column, hydrodynamic dredging (water jet), stationary placement. This means that no permit by the Federal States is needed for disposal/placement of dredged material within Federal waterways.</p> <p><u>HTG-FA Dredged Material (2002):</u> Aquatic disposal/placement of dredged material is one continuous process comprising dredging, transport and placement of dredged material at another site within the same body of water.</p> <p>The process of aquatic disposal/placement must be distinguished from dumping (introduction/discharge), when dredged material originating from one body of water is introduced into another body of water or is introduced from land into a water body.</p>	

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	dredged material.		
(Marine) Dumping – Verklappen von Abfällen auf See	<p><u>OSPAR Convention 1992 (Article1):</u></p> <p>(f) "Dumping" means</p> <p>i. any deliberate disposal in the maritime area of wastes or other matter</p> <p>1.from vessels or aircraft;</p> <p>2.from offshore installations;</p> <p>ii. any deliberate disposal in the maritime area of</p> <p>1.vessels or aircraft;</p> <p>2.offshore installations and offshore pipelines.</p> <p>(g)"Dumping" does not include:</p> <p>the disposal in accordance with the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, or other applicable international law, of wastes or other matter incidental to, or derived from, the normal operations of vessels or aircraft or offshore installations other than wastes or other matter transported by or to vessels or aircraft or offshore installations for the purpose of disposal of such wastes or other matter or derived from the treatment of such wastes or other matter on such vessels or aircraft or offshore installations.</p>		

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Capping – Abdeckung (im Wasser oder an Land)	<p><u>PIANC ENVICOM 3 (2000):</u> The controlled, accurate placement of contaminated material at an open-water site, followed by a covering or cap of clean material to isolate contaminated sediment from the overlying aquatic environment.</p> <p>DISCUSSION - (1) In this context, "contaminated" refers to material found to be unacceptable for unrestricted open-water placement because of potential contaminate effects, while the term "clean" refers to material found to be acceptable for such placement. (2) "Capping" is also used to describe the placing of fine material on sandy dredged material for the purpose of vegetating the placement site.</p> <p><u>PIANC ENVICOM 5 (2002):</u> The controlled, accurate placement of contaminated dredged material at a subaquatic site, followed by a covering or cap of clean isolating material. Subaqueous capping can be done in-place within an existing natural depression or in a prepared excavation.</p>		Definition in general the same as the definition form PIANC. Capping can be used to remediate contaminated aquatic soils (IBC sanering).
Confined Disposal Facility (CDF)	<p><u>PIANC ENVICOM 5 (2002):</u> A CDF is an engineered construction for the containment of contaminated dredged material with the purpose to control poten-</p>		The Governmental decision on the removal of dredged material (1993) contains a directive for large scale disposal facilities (confined) for Dredged Mate-

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	<p>tial releases to the environment. The term CDF is used in this document in its broadest sense. Confined (diked) disposal is placement of dredged material in an engineered structure consisting of dikes or other structures that enclose a placement area above any adjacent water surface, isolating the dredged material from adjacent waters during placement. Other terms that appear in the literature for diked CDFs include "confined disposal area," "confined disposal site," and "dredged material containment area." Diked CDFs may be constructed as upland sites, nearshore sites with one or more sides in water.</p> <p>For the purpose of this report subaqueous capping or contained aquatic disposal sites are referred to as subaquatic CDFs.</p>		<p>rial.</p> <p>Aquatic disposal is disposal beneath the (ground)waterlevel. Also a directive for confined disposal facilities on land (above groundwater) exists</p>
Contained (sub)aquatic disposal/placement	<p><u>PIANC ENVICOM 3 + 5 (2000/2002):</u></p> <p>A form of capping which includes the added provision of some form of lateral containment (for example, placement of the contaminated and capping materials in bottom depressions or behind subaqueous berms) to minimize spread of the materials on the bottom.</p>		<p>The Governmental decision on the removal of dredged material (1993) contains a directive for large scale disposal facilities for Dredged Material. Aquatic disposal is disposal beneath the (ground)waterlevel.</p>

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III-3.2. (Up)Land disposal			
Interim disposal/ stockpile – Zwischenlagerung	<p><u>ISO/CD 11074-3 (soil quality):</u></p> <p>Temporary deposit of soil material for later use.</p>	<p><u>DepV (Government resolution of 13 March 2002) §1 (3):</u></p> <p>This ordinance does not apply to ...</p> <p>5. The storage of wastes in long-term storage facilities, provided the wastes are stored before Recovery over a period of less than three years.</p> <p><u>HABAB-WSV (2000):</u></p> <p>Pursuant to §4 Section.1 of the Pollution Protection Act (<i>BimSchG</i>) in combination with the Ordinance on Plants Subject to Approval (<i>4. BimSchV</i>), stationary waste disposal facilities for stockpiling or treatment of wastes requiring monitoring or requiring special monitoring, that are operated longer than 12 months at the same location require above a certain throughput volume, capacity or total storage capacity a permit pursuant to legislation on pollution-protection with an integrated environmental impact study (Nrs. 26 and 27 of the Annex to No. 1 of the Enclosure to §3 <i>UVPG</i> (Environmental Impact Assessment Act), [10].</p>	

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<p>Landfilling – Deponieren</p> <p><u>note:</u> Landfilling is one option of the meaning of "Disposal" in EC Waste Framework Directive (see definition "disposal").</p>	<p><u>EC Framework Directive on Waste, Article 1:</u> For the purposes of this Directive: (e) "disposal" shall mean any of the operations provided for in Annex IIA; ANNEX IIA: Disposal operations D 1 Deposit into or onto land (e.g. landfill, etc.) (for further explanations see definition "disposal")</p> <p><u>PIANC ENVICOM 3 (2000):</u> An activity for disposing of solid waste materials in land based sites.</p>	<p><u>(German) Closed Substance Cycle and Waste Management Act (KrW-/AbfG) §27:</u> (1) For purposes of disposal, waste may be treated, stored or landfilled only in authorised plants or facilities (waste disposal facilities). In addition, treatment of waste for disposal is permitted in facilities that primarily serve a purpose other than waste disposal and that require a licence pursuant to Article 4 of the Federal Immission Control Act.</p> <p><u>HABAB-WSV (2000):</u> Dredged material, that is to be stored without specifically designated purpose on land in order to get rid of it, falls into category of waste for disposal.</p> <p><u>HTG-FA Dredged Material (2002):</u> Landfilling is the permanent removal from the cycle of matter for the protection of the public welfare. Landfilling presupposes prove that recovery or more-environmentally sound options of disposal are not reasonable. Landfilling may require treatment of the dredged material to minimize the amount to be disposed of.</p>	
<p>Final disposal site/ Landfill – Abfalldeponie</p>	<p><u>PIANC ENVICOM 3 (2000):</u> Final disposal site refers to a whole entity of place, facilities and equipment for the disposal of ordinary and industrial wastes by landfill. Final disposal sites for industrial wastes are divided into three types: stable type (waste plastic, etc.), controlled type (sludge, etc.) and shielded type (waste containing toxic substances).</p>	<p><u>(German) Closed Substance Cycle and Waste Management Act (KrW-/AbfG) §3 (10):</u> Landfills in the sense of this Act are disposal facilities for dumping of wastes above ground (surface dump) or below the earth's surface (underground dump). Landfills are also in-plant waste disposal facilities for the dumping of wastes in which the producer of</p>	

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		<p>the waste disposes of the waste at the site of its occurrence.</p> <p><u>DepV §2:</u> A mono-dump is a landfill or a section thereof in the landfill classes 0, I, II, or III, where specific bulk waste materials that behave similar regarding their type, contaminant content, or reactivity and are mutually compatible are dumped without being mixed with other wastes.</p> <p><u>HTG-FA Dredged Material (2002):</u> Confined disposal/placement of dredged material is a technical facility for enclosing and isolating contaminated dredged sediments from the environment with the aim to control and master potential environmental impacts.</p>	
III-3.3. Beneficial use (re-use)			
Beneficial use (recovery, re-use) with/without treatment - Verwerten/Verwenden	<p><u>PIANC ENVICOM 3 (2000):</u> Typically refers to placement or use of dredged material for some useful and/or productive purpose. Beneficial uses may involve either the dredged material or the dredged material placement site as the integral component of the beneficial use. Examples of beneficial use range from fish and wildlife habitat development, to human recreation, to industrial/commercial uses.</p>	<p>In German terminology "beneficial use" may have different meanings: Direct use (without treatment) or beneficial use (with treatment).</p> <p>(1) Direct use: <u>HABAB-WSV (2000):</u> A direct use option exists if the dredged material is assigned to another purpose without delay. The new use need not be effected immediately. In principle, intermediate storage does not interrupt immediateness. However, the new use option must be fixed already when intermediate</p>	

TERM – BEGRIFF -	EXISTING INTERNATIONAL DEFINITIONS	EXISTING GERMAN DEFINITIONS	EXISTING DUTCH DEFINITIONS
	<p><u>PIANC ENVICOM 5 (2002):</u> Placement or use of dredged material for some productive purpose. Beneficial uses may involve either the dredged material or the placement site as the integral component of the beneficial use.</p> <p><u>ISO/CD 11074-3 (soil quality):</u> Useful and harmless utilisation of soil material.</p>	<p>storage begins. If the implementation of the new purpose requires any treatment, this constitutes - as a rule - a negation of immediateness. Such cases are not direct uses but beneficial uses of waste (cf. Section 4.3.2). Treatment is an intermediate step with the aim to change the quality of the dredged material. If an option for an immediate use of dredged material exists, this dredged material is - as a rule - not waste.</p> <p><u>HTG-FA Dredged material (2002):</u> Direct use is the immediate utilization of dredged material without prior treatment.</p> <p>(2) Beneficial use <u>HABAB-WSV (2000):</u> Beneficial use differs from direct use by the fact that beneficial use, in principle, requires prior treatment of the dredged material. Dredged material intended for beneficial use is waste for use. Beneficial use in the sense of the Closed Substance Cycle and Waste Management Act means for dredged material exclusively use in the material sense §4, Section 1, No. 2 in combination with §4, Section 3 <i>KrW-/AbfG</i>, [13]).</p> <p><u>DIN 19731 Recovery of soil material (1998):</u> Spreading or backfilling of soil material for soil amelioration, recultivation and for construction purposes.</p>	

TERM – BEGRIFF -	EXISTING INTERNATIONAL DEFINITIONS	EXISTING GERMAN DEFINITIONS	EXISTING DUTCH DEFINITIONS
		<u>HTG-FA Dredged material (2002):</u> Recovery is the application of dredged material after treatment as a substitute to save natural resources.	
Application – Aufbringen		<u>Soil Protection Act (BBodSchV §12):</u> (1) To produce a soil layer suitable for root penetration only soil material and dredged material pursuant to DIN 19731 (Issue 5/98) and mixtures of soil material with such wastes that satisfy the material quality criteria of the ordinances issued according to §8 of the Closed Substance Cycle and Waste Management Act and the Sewage Sludge Ordinance may be spread onto or introduced into soils. <u>DIN 19731 Recovery of soil material (1998):</u> Spreading or introduction of soil material is the recovery of soil material for soil amelioration or recultivation.	
Pretreatment – Vorbehandlung/ Aufbereitung	<u>PIANC PTC I-17 (1996):</u> Any of the wide variety of methods which prepare dredged materials for additional treatment and/or placement activities. They are not effective in the removal or treatment of toxic materials in sediments. Pretreatment decisions are greatly influenced by dredging, treatment and placement decisions.		
Treatment – Behandlung		<u>DepV §2 (Government resolution of 13 March 2002):</u> Physical, thermal, chemical, or biological processes or combinations of processes that change the amount or the harmfulness of	<u>Tienjarens scenario:</u> Treatment of DM (verwerken) in such a way that the result is a building material.

TERM – BEGRIFF -	EXISTING INTERNATIONAL DEFINITIONS	EXISTING GERMAN DEFINITIONS	EXISTING DUTCH DEFINITIONS
		<p>wastes in order to reduce their volume or their hazardous properties, to facilitate their handling, favour their Recovery or ensure the observation of the classification criteria pursuant to Annex 3 of this ordinance or pursuant to Annex 1 or 2 of the <i>AbfAbIV</i>.</p> <p><u>HTG-FA Dredged Material (2002):</u> Treatment is a purposive and temporarily limited process for the improvement of the properties of the dredged material and/or the mitigation of its harmfulness with the aim of its further beneficial use or disposal.</p>	
IV. Environmental Assessment			
Environmental Assessment (EA)	<p><u>PIANC ENVICOM 3 (2000):</u> A written environmental analysis which is conducted to determine whether a proposed undertaking would significantly affect the environment. The conducting of an environmental assessment for a proposed project is usually a mandatory requirement of various jurisdictional authorities. (Also see Environmental Impact Assessment, EIA).</p>		

TERM – BEGRIFF -	EXISTING INTERNATIONAL DEFINITIONS	EXISTING GERMAN DEFINITIONS	EXISTING DUTCH DEFINITIONS
Environmental Impact Assessment (EIA) – Umweltverträglichkeitsprüfung	<p><u>Council Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment (amended by Council Directive 97/11/EC of 3 March 1997):</u></p> <p>Art. 3:</p> <p>The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case and in accordance with Articles 4 to 11, the direct and indirect effects of a project on the following factors:</p> <ul style="list-style-type: none"> - human beings, fauna and flora; - soil, water, air, climate and the landscape; - material assets and the cultural heritage; - the interaction between the factors mentioned in the first, second and third indents. <p><u>PIANC ENVICOM 3 (2000):</u></p> <p>Environmental impact assessment refers to a system involving the investigation, estimation and evaluation of the effect of a project or activity on the environment and is usually conducted by the proponent for the proposed undertaking in the process of planning. (Also see Environmental Assessment, EA)</p>	<p><u>Environmental Impact Assessment Act, 2001 (Gesetz über die Umweltverträglichkeitsprüfung (UVPG)):</u></p> <p>Art. 2 (1):</p> <p>The environmental impact assessment represents an integral part of procedures applied by authorities when deciding upon the approval of projects. Environmental impact assessment comprises identification, description and assessment of a project's effects on</p> <ul style="list-style-type: none"> - human beings, animals and plants, - soil, water, air, climate and landscape, - cultural heritage and other material assets, and - the interactions between the foregoing protected assets. <p>Environmental impact assessments shall be conducted with the involvement of the public. If decisions on the admissibility of a project are taken in more than one procedure, the individual assessments made in these procedures shall be combined to provide an overall assessment of all environmental impacts, including interactions.</p>	

TERM – BEGRIFF -	EXISTING INTERNATIONAL DEFINITIONS	EXISTING GERMAN DEFINITIONS	EXISTING DUTCH DEFINITIONS
	<p><u>PIANC ENVICOM 5 (2002):</u> The Environmental impact assessment is a written environmental analysis involving the investigation, estimation and evaluation of the effect of a project or activity on the environment and is usually conducted by the proponent for the proposed undertaking in the process of planning. The conducting of an environmental assessment for a proposed project is usually a mandatory requirement of various jurisdictional authorities.</p>		
Risk Assessment – Risiko-Einschätzung	<p><u>PIANC ENVICOM 3 (2000):</u> In dealing with environmental problems, a certain degree of uncertainty is unavoidable, despite advances made thus far in the scientific elucidation of negative impact (or risk) on human beings and the natural environment. However, irreversible damage could be made if necessary measures were delayed until complete scientific elucidation is achieved. In such a situation, an integrated policy-making approach of two processes, scientifically estimating and evaluating the negative impact of human activities on humans and the environment (risk assessment) and deciding and executing rational policies for risk mitigation based on risk assessment (risk management), is becoming established. International agreement made on the protection of the ozone layer is a precedent of this approach.</p>		

TERM – BEGRIFF -	EXISTING INTERNATIONAL DEFINITIONS	EXISTING GERMAN DEFINITIONS	EXISTING DUTCH DEFINITIONS
Bioassay – Biotest	<p><u>PIANC ENVICOM 3 (2000):</u></p> <p>A bioassay is an assay using a biological system. It involves exposing an organism to a test material and determining a response. There are two major types of bioassays differentiated by response: toxicity tests which measure an effect (e.g. acute toxicity, sublethal/chronic toxicity) and bioaccumulation tests which measure a phenomenon (e.g. the take of contaminants into tissues).</p>		

Annex II: Comparison of legislation (survey table)

European Community	The Netherlands				Germany				
Policy Documents/Acts/Directives	Laws/Acts	Ordinance	Guidelines	Comments	Laws/Acts	Ordinance	Guidelines	Comments	Comparison
	NW4 (2000)* (4th National Policy document on water-management)	-	-	This document is not an Act. It gives an overall strategy for water-management in The Netherlands incl. Dredged Material; specific quality criteria (target and/or risk levels) for surface water and sediments; specific criteria for relocation of Dredged Material in fresh and sea-water; those criteria are implemented in the Soil Protection Act and Water Protection Acts (sea and fresh water). Execution of the actions mentioned in the document has to be done within the existing legal framework.	There is no national policy document on dredged material management in Germany, but e.g. in the Federal State of Hamburg the following document was made: Mitteilung des Senats an die Bürgerschaft: Sicherung der Unterbringung des Baggergutes aus Hafen und Elbe (28.09.99)		Positionspapier des FA Baggergut der Hafenbau Technischen Gesellschaft (HTG, 2002) (Recommendation of the HTG, 2002)	The "Mitteilung des Senats an die Bürgerschaft" is more a description of the state of the art of dredged material management with a special focus on Hamburg. There are no criteria given in the document. The recommendation of HTG has a national view with emphasis on the coastal region.	In Germany a national policy document on dredged material comparable to the Dutch NW4 doesn't exist. In Germany national water quality criteria for inland water are developed by the LAWA (Länder expert group on water) which include quality criteria for suspended matter; this classification system is going to be revised and foreseen for the EU-WFD
	BVB (1994) (Governmental decision on removal of dredged material)	Directive for large disposal sites (1994).		This document is not an act but describes the policy on DM-Management in The Netherlands. It contains a national directive for CDFs (1994). Main goal of the directive is to protect groundwater quality. The directive doesn't prescribe technical measurements. (EU-landfill directive is technically more detailed and prescribes specific technical measurements). Execution of the directive is only possible within legal framework of WVO, WBB and WM.				In Germany the construction of Confined Disposal Facilities (CDF) for dredged material is not specially regulated. For CDFs on land the waste legislation especially the coming Landfill Ordinance (DepV) apply. For (sub)aquatic CDFs the water legislation applies	In comparison to Germany NL has a national policy for Dredged Material which includes CDF's in water.
OSPAR (Conventions for the Protection of the Marine Environment of the North East Atlantic) OSPAR-Guidelines for the management of dredged material	WVZ (Sea water protection law - 1975)	Ordinance: List of contaminants for dredged material (implementation of OSPAR)		Regulates the relocation of DM into the sea. Relocation of dredged material is permitted if quality does not exceed the quality standards for salt-water sediments as mentioned in NW4 and the WVZ ("content-test")			HABAK-WSV 1999 (Directive for the German Water- and Shipping Administration for the handling of dredged material on all coastal federal waterways)	The contents of the OSPAR-Guidelines for the management of DM are implemented by HABAK-WSV on federal coastal waterways. There is a political mandate that this directive shall be the fundament for a Bund-/Länder-Working Group (BLABAK) to create a national directive for all German authorities competent on coastal waters. One recent outcome is a national concept for the handling of TBT contaminated dredged material in coastal waters.	In Germany and The Netherlands the OSPAR guidelines are implemented for the protection of the Marine environment, but technical criteria differ.
European Water Framework Directive - Council Decision of 29. 23.10.2000 (effects all existing EU- and national water regulations)							Arbeitshilfe der LAWA zur Umsetzung der Wasserrahmenrichtlinie vom 27.02.2002 (Guidance for the implementation of the WFD)	The implementation process is documented. On the internet platform WasserBlick (http://www.wasserblick.net)	Currently it is not really clear in Germany and The Netherlands how the consequences of the EU-WFD will effect dredged material handling. Sediments will be an indicator/controlling factor for water quality. New substances from the list of "Priority substances" will be added in monitoring programmes. A temporal (3 years) EU-network on sediments called SedNet has started in January 2002. Problematic is the question how to deal with "heavily modified waters (water-ways)". For this question the EU WFD Common Implementation Strategy (CIS) Working Group 2.2 on Heavily Modified Water Bodies (HMWB) has set up a first draft (22.May 2002): Guidance Document on Identification and designa-

European Community	The Netherlands				Germany				
Policy Documents/Acts/Directives	Laws/Acts	Ordinance	Guidelines	Comments	Laws/Acts	Ordinance	Guidelines	Comments	Comparison
									tion of Heavily Modified Water Bodies.
European Surface Water Directive - 75/440/EEC - Council Decision of 1975 (This directive shall be repealed with effect from seven years after the date of entry into force of the Water Framework Directive in 2000)	WvO (Surface Water protection law - 1969)	A number of ordinances on discharges of specific waste water and on evaluating permits every 4 years (1993, Stb 81)	Assessment of effects of waste water disposal out of CDF's for dredged material (1994, RIZA, docnr. 94.102X)	Every dredging activity carried out in surface (fresh) water needs to be permitted (dredging, relocation, discharges...); the general relevance of this act is decreasing because of developments in the environmental protection act (WM). Quality standards are connected to NW4.	Wasserhaushaltsgesetz – WHG, Gesetz zur Ordnung des Wasserhaushaltes vom 12-11-1996 (Federal Water Act) and derived LÄNDER - water acts	Implementation by Länder-ordinances	ARGE Elbe (1996): Umgang mit belastetem Baggergut an der Elbe (agreed by 7 Länder on the Elbe river)	The Federal Water Act stipulates the non-deterioration principle for surface and groundwater without standards. The handling of Dredged Material is not mentioned or specially regulated in the German water legislation. Under this framework each Land has its own water law and ordinance. Permits for maintenance dredging and relocation activities in Länder waters are obligatory (not in federal waterways) but there is no nationally agreed guidance (criteria) yet. The guideline of Arge Elbe is the only one which regulates the relocation of dredged material in water outside the federal waterways.	The general approach to obtain permissions for dredging is the same in Germany and The Netherlands, but the standards are different and for sediments more detailed in NL.
International Commission or the Protection of the River Rhine (ICPR, 1997) : Recommendation No.89. Criteria for the relocation of dredged material in the River Rhine and its tributaries (signed by The Netherlands, France, Switzerland, Germany)	-Water Administration Act 1900 (Waterstaatswet) -Water Management Act 1989 (Wet op de waterhuishouding) - Act on the maintenance of the waterworks (WBR)	Waterboard-acts (Keur)		Those Acts are relevant to the responsibilities for water management. Different governmental authorities are responsible for water management (quality and quantity). Waterboards do have their own acts which are mainly relevant to water quantity and safety (of dikes).	Bundeswasserstraßengesetz – WaStrG (Federal Waterways Act)		HABAK-WSV 1999 (for dredged material on coastal federal waterways) HABAB-WSV 2000 (for dredged material on inland federal waterways)	The approach is the same as in HABAB-WSV. The Federal Waterways Act regulates the maintenance of the federal waterways in all 16 Länder for navigation (including the control of water levels, water discharge, morphology, dredging etc.) under consideration of the drinking water management and environment. HABAB (2000) and HABAK (1999) contain all relevant and obligatory steps in DM Management on federal waterways. The "Arge Elbe guideline on dredged material " (from the 7 Länder on Elbe river) has a different approach for relocation than HABAB, which is more comparable to the Dutch water protection act and the ICPR-criteria	In The Netherlands the main water-systems have to be managed by Rijkswaterstaat (Rijkswateren), regional water-systems are managed by waterboards (waterschappen) or the regional authorities (provinces). Maintenance dredging on federal waterways needs no permit in Germany because of the federal waterways act but the criteria in HABAB and HABAK make sure that the handling is environmentally-sound.
European Urban Waste Water Directive - 91/271/EC - Council Decision of 21.May 1991 (amended by Commission Directive 98/15/EC of 27 February 1998).	WvO (Surface Water protection law - 1970) (Also regulated in WM)	Ordinances on the discharge of waste water (o.a. lozingenbesluiten glastuinbouw, tandartspraktijken 1994, resp Stb 669 en 818)		Industrial and urban waste water has to be collected and treated before discharging is allowed. Taxes have to be paid by the “polluter” (companies and houses).	§ 7a (Requirements applying to the discharge of waste water) of the Federal Water Act (Wasserhaushaltsgesetz) Länder - water acts	Verordnung über Anforderungen an das Einleiten von Abwasser in Gewässer – Abwasserverordnung vom 15.10.2002 (Waste Water Ordinance) Länder - Ordinances	Merkblatt ATV-M362, Teile 1-3: Umgang mit Baggergut (1997-1999) (Technical Association of Waste Water: Handling of DM)	Regulates the demands for waste water (e.g. for upland disposal sites/landfills). Does not apply for discharge water in flushing fields where flushing water is used as transport medium. The ATV recommendations give comprehensive guidance to the management of DM including case studies.	The general approach seems to be similar.
European Groundwater Directive - 80/68/EEC - Council Decision of 1980 (This directive shall be repealed with effect from seven years after the date of entry into force of the Water Framework Directive in 2000).	WBB (1986) (Soil protection act) Chapter on restoration of polluted terrestrial soils since 1994 and specific rules for restoration of aquatic soils since 1997	Building Material Decree (1995, Stb 567 and 1999)	Guidelines for soil investigation: Protocol orienterend onderzoek Protocol nader onderzoek Urgentie-systeematiek Sanerings-onderzoek Guidelines for analysis-methods (NEN)	Purpose is the protection of soils, sediment and groundwater. Regulates handling and restoration of contaminated soils (aquatic soils included). Quality standards for soil and groundwater are included. (see also NW4) The Building material decree makes a difference between 3 categories of building materials based upon the leaching of the building material.	Wasserhaushaltsgesetz – WHG, Gesetz zur Ordnung des Wasserhaushaltes vom 19.08.2002 (Federal Water Act) und Länderwassergesetze (Länder - water acts) Bundes-Bodenschutzgesetz – BBodSchG (1998), Gesetz zum Schutz vor schädlichen Bodenveränderungen und zur Sanierung von Altlasten und Landesbodenschutz-gesetze (Federal Soil Protection Act and derived Soil Protection Acts of the Länder)	Grundwasserverordnng vom 18.3.1997 (Groundwater Ordinance) Bundes-Bodenschutz- und Altlastenverordnung – BBodSchV (1999) (Federal Soil Protection and Contaminated Site Ordinance)	Erste allgemeine Abfallverwaltungsverfahren über Anforderungen zum Schutz des Grundwassers bei der Lagerung und Ablagerung von Abfällen vom 31.Jan.1990 (Administrative instructions for groundwater protection at waste disposed) DIN 19731 (1998): Verwertung von Bodenmaterial (reuse of soil material) – currently under revision LABO 1996: Anforderungen an die	Aquatic sediments and soils are not in the scope of this law. But this act and its ordinance affect upland placement/beneficial use of dredged material significantly. Permits are needed if DM is regarded as a soil for upland placement (use). In consequence to the new Federal Soil Protection Act and Ordinance the soil standards in different regulations (BBodSchV, AbfKlärV, LAGA- TR 20, BioAbfV, UVPVwV) are going to be harmonised.	Dutch soil protection act includes aquatic soils (sediments/dredged material) and gives quality criteria for soils, aquatic soils and groundwater.

European Community	The Netherlands				Germany				
Policy Documents/Acts/Directives	Laws/Acts	Ordinance	Guidelines	Comments	Laws/Acts	Ordinance	Guidelines	Comments	Comparison
							Verwertung von kultivierbarem Bodenmaterial Various Länder guidelines with soil and groundwater quality standards		
European Waste Directive 75/442/EEC - Council Decision of 15.July 1975 (modified through decisions 91/156/EEC and 96/350/EC)	WM 1993 (Environmental protection law) WBB (1986)	Decision on facilities and permits (1993 revised in 1997) Decision on relocation of DM of classes 1 and 2 (1993 and 2001) (Besluit vrijstelling stortverbod buiten inrichtingen) “Provincial” environmental acts (PMV) Waste Decrees (1993 - 1995) (o.a. : Besluit stortverbod afvalstoffen Stortbesluit bodembescherming (1993, Stb 55) Decree on the assessment of DM for nautical dredging projects. (regeling vaststelling klasse-indeling onderhoudsbaggerspecie (1994, Stcrt 246)		General goal of the environmental protection law (WM) is the protection of the environment. The Act is a framework which is filled by several ordinances for specific subjects, for example the ordinance on the allowance of relocation of DM of classes 1 and 2 in surface waters. Classes 3 and 4 have to be disposed of in a CDF. The definition of waste is in Dutch legislation in general the same as in the EC directive. Waste decrees are part of the WM and WBB. For DM are of importance e.g. - decree on the landfill of waste - decree on disposal of waste Treatment of DM is under environmental law, permits are needed for such facilities.	Kreislaufwirtschafts- und Abfallgesetz – KrW-/AbfG (1994) ((German) Closed Substance Cycle and Waste Management Act)	Verordnung über Abfallwirtschaftskonzepte und Abfallbilanzen (Abfallwirtschaftskonzept- und Bilanzverordnung – AbfKoBiV) vom 13.09.1996 (Ordinance on Waste Management Concepts and Waste Balance Sheets) Verordnung über Verwertungs- und Beseitigungsnachweise (Nachweisverordnung – NachwV) vom 17.06.2002 (Ordinance on Waste Recovery and Disposal Records) Verordnung zur Transportgenehmigung (Transportgenehmigungsverordnung – TgV) vom 10.9.1996 (Ordinance on Transport Licences)	Zweite allg. Verwaltungsvorschrift zum Abfallgesetz (TA-Abfall), Teil 1 vom 12.03.1991 (Technical rules for the treatment and disposal of hazardous waste) Dritte allgemeine Verwaltungsvorschrift zum Abfallgesetz: Technische Anleitung zur Verwertung, Behandlung und sonstigen Entsorgung von Siedlungsabfällen - TA Siedlungsabfall vom 14.Mai 1993 (Technical directive for beneficial use, treatment and disposal of urban wastes) Anforderungen an die stoffliche Verwertung von mineralischen Reststoffen - Technische Regeln 20 der LAGA (1997, derzeit in Überarbeitung) Demands for the beneficial use of mineral residues – technical rules of the LAGA (waste expert group of all Länder, currently under revision) Brandenburgische Technische Regeln – BB TR-EvB 2000: Anforderungen an die Entsorgung von Baggergut (Brandenburg Technical Rules: Demands for the reuse and disposal of DM) Guideline for the reuse and disposal of DM in Sachsen-Anhalt (1999) Umweltministerium Mecklenburg-Vorpommern 1999:	These regulations apply if dredged material is regarded as waste and foreseen for upland reuse or disposal. The LAGA classes Z0-Z2 (criteria for soil and elutriate) allow reuse under specific conditions. LAGA-classes Z3-Z5 define different landfill classes as mentioned in TAsi by elutriate assessment only. Z5 is landfill for hazardous waste. Some Länder have recently introduced dredged material guidelines for this purpose. Aquatic reuse and disposal is not foreseen to be regulated in the waste regulations.	

European Community	The Netherlands				Germany				
Policy Documents/Acts/Directives	Laws/Acts	Ordinance	Guidelines	Comments	Laws/Acts	Ordinance	Guidelines	Comments	Comparison
					<p>Bundes-Immissionsschutzgesetz – BImSchG, Gesetz zum Schutz vor schädlichen Umwelteinwirkungen durch Luftverunreinigungen, Geräusche, Erschütterungen und ähnliche Vorgänge (Law for the protection against harmful influences to the environment by air pollution, noise, vibrations etc.)</p> <p>Bundes-Berggesetz – BBergG vom 24.07.2002 (Federal Mining Act)</p>	<p>Versatz-Verordnung (VersatzV, 24.07.2002) (Ordinance on underground waste storage)</p>	<p>Verwertungsstrategien für aquatische Sedimente (Ministry of Environment of Mecklenburg-Vorpommern: reuse-strategies for aquatic sediments)</p> <p>Anforderungen an die stoffliche Verwertung von Abfällen im Bergbau über Tage; Technische Regeln für den Einsatz von bergbau-fremden Abfällen im Bergbau über Tage (Demands to the beneficial use of wastes in mining the facilities above earth surface – technical rule for non-mining wastes)</p> <p>Anforderungen an die stoffliche Verwertung von mineralischen Abfällen als Versatz unter Tage; Technische Regeln für den Einsatz von bergbaufremden Abfällen als Versatz (Demands to the beneficial use of wastes in mining facilities below the earth surface – technical rule for non-mining wastes)</p>	<p>If a new DM-upland disposal site shall be constructed (also very simple ones) a permit after BImSchG is needed.</p> <p>If dredged material shall be reused in mining facilities (e.g. gravel pits, coal shafts, salt caverns) a permit by Federal Mining Act is obligatory (not after Waste Act).</p>	
European Hazardous Waste Directive 91/689/EEC + Council Decision of 12 December 1991 European list of waste material: 2000/532/EEC (3-	WM 1993 (Environmental protection law)	EURAL, European list of waste materials (1-05-2002) replaces the dutch Hazardous waste decree		see above, Waste materials or DM have to be regarded as hazardous if concentration limits mentioned in EURAL are exceeded in the DM.	Kreislaufwirtschafts- und Abfallgesetz – KrW-/AbfG (1994) ((German) Closed Substance Cycle and Waste	Same ordinances as under European Waste Directive	Same guidelines as under EU Waste Directive	The determination when a waste is regarded as hazardous is not cleared finally. A waste expert group is formed to develop criteria for the term “ecotoxic”	

European Community	The Netherlands				Germany				
Policy Documents/Acts/Directives	Laws/Acts	Ordinance	Guidelines	Comments	Laws/Acts	Ordinance	Guidelines	Comments	Comparison
05-2000), replaces decision 94/3 EC on the appointment of a list of waste materials in accordance to art 1 sub a of directive 75/442/EEC, and decision 94/904/EC on the appointment of a list of hazardous waste materials in accordance to art 1, sub 4 of directive 91/689/EEC regarding hazardous waste.		(1993) (BAGA, Stb 617) Decision on facilities and permits (1993, revised in 1997)			Management Act)			(waste class H14).	
European Landfill Directive – 199/31/EC - Council Decision of 26. April 1999	WM (1993) (Environmental protection law) WBB 1986	Directive for CDFs for dredged material on land (draft 2001) Decision on the landfill of waste (Stortbesluit bodembescherming (1993, Stb 55)	-	Since the landfill directive is only relevant to disposal sites on land a Dutch directive for CDFs on land is in preparation. Goal is to make an directive for all CDFs for DM within the environmental law. The directive does not prescribe specific isolative means, but defines the "maximum" impact on groundwater that is regarded as tolerable. Directive for disposal of other wastes. Prescribes technical means.	Kreislaufwirtschafts- und Abfallgesetz – KrW-/AbfG (1994) ((German) Closed Substance Cycle and Waste Management Act)	Deponieverordnung (Landfill Ordinance) (24.07.2002) Verordnung über die umweltverträgliche Ablagerung von Siedlungsabfällen (Abfallablagerungsverordnung – AbfAbIV) vom 20.2.2001 (Ordinance on Environmentally Compatible Storage of Waste from Human Settlements) Verordnung über den Versatz von Abfällen unter Tage –VersatzV vom 24.07.2002) (Ordinance on underground waste storage)	Brandenburgische Technische Regeln – BB TR-EvB 2000: Anforderungen an die Entsorgung von Baggergut (Brandenburg Technical Rules: Demands for the reuse and disposal of DM) Guideline for the reuse and disposal of DM in Sachsen-Anhalt (1999)	The EU-landfill directive affects for dredged material handling . Although the special disposal problems of DM seemed not to be well considered in the directive. This may have significant effects to national implementation. To solve these problems special regulations for the disposal of dredged material were introduced in the new German landfill ordinance).These take the different characteristics and the special disposal conditions of DM into account. Subaquatic disposal is not under the scope of waste legislation.	In The Netherlands a specific directive for disposal of DM exists. In Germany this is not foreseen.
European Waste Catalogue - (EWC) – 94/904/EC - Council Decision of 22.December 1994 (revised by Council Decision 2000/532/EC of 3 May 2000 replacing Decision 94/3/EC and Council Decision 94/904/EC)	WM 1993 (Environmental protection law) WMB (Environmental tax act)	Criteria for treatability of contaminated DM (in preparation)		See above Taxes will be levied if treatable DM is disposed of in facilities		Verordnung über das Europäische Abfallverzeichnis AVV – Abfallverzeichnis-Verordnung vom 10. Dezember 2001 (Ordinance on the implementation of the European Waste List of 10 December 2001) BestüVAbfV – Verordnung zur Bestimmung von überwachungsbedürftigen Abfällen zur Verwertung vom 10.09.1996 (Ordinance for the determination of wastes requiring special supervision for use)		Dredged Material is mentioned under EWC-Code 17 „construction and demolition waste (including road construction): subcode 17 05 into soil and dredging spoil with the codes 170303 “soils and stones containing dangerous substances“ 170304 “soils and stones other than those mentioned in 170503“ 170305 „dredging spoil containing dangerous substances“ 170306 „dredging spoil other than those mentioned in 170505“ The determination when waste is regarded as hazardous is not cleared finally for the criteria “ecotoxic” (waste criteria H14).	
The Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes	WM 1993 (Environmental protection law)	PMV (regional environmental act)		Trans boundary movements of waste need a permit based upon the WM. Also interregional transport of contaminated DM is regulated by regional acts (PMV).	Abfallverbringungsgesetz – AbfVerbrG vom 30.09.1994 (Waste Movement Act)			Seems to be of less importance for DM but it has to be considered.	
European Construction Products Directive (26. April 1999)	WBB 1986 (Soil protection law)	Building Materials Decree (1999)	Guidelines on the way of assessing the quality of products.	The building materials decree is also relevant to the re-use of soils. Depending on the amounts of heavy metals and organic contaminants soils can be used as a building material. For metals also leaching is a criterion. There are 3 categories of building materials. Category 0 is clean material and can be used freely, Category 1 is slightly contaminated and can be used under certain conditions.	Baugesetzbuch (BauGB) vom 27.08.1997 (Federal Construction Act) Bauproduktengesetz Bau PG vom 28.04.1998 (Construction Products Act)		Anforderungen an die stoffliche Verwertung von mineralischen Reststoffen – Technische Regeln 20 der LAGA (Demands for the beneficial use of mineral residues – technical rules of the LAGA (waste expert	Dredged material with LAGA classes Z0-Z2 are allowed for the use as construction material only. The DIBT-guideline gives special guidance and criteria how to investigate construction products.	

European Community	The Netherlands				Germany				
Policy Documents/Acts/Directives	Laws/Acts	Ordinance	Guidelines	Comments	Laws/Acts	Ordinance	Guidelines	Comments	Comparison
				Category 2 is more contaminated and can only be used above groundwater if isolated from the environment. This is also valid for products out of DM.			group of all Federal States) Merkblatt zur Bewertung der Auswirkungen von Bauprodukten auf Boden und Grundwasser - Deutsches Institut für Bautechnik - DIBT; Entwurf vom Juli 2000 (DIBT-Draft Guideline for the assessment of impact of construction products on soil and groundwater)		
European Environmental Impact Assessment Directive - 85/37/EEC, Council Decision of 1985	WM 1993 (Environmental protection law)	Decision on Environmental Impact assessment (1994)	-	For certain activities (like for example the building of a large scale CDF) an environmental impact assessment has to be carried out.	Gesetz über die Umweltverträglichkeitsprüfung – UVPG (Environmental Impact Assessment Law) vom 05.06.2001 Umweltauditgesetz - UAG vom 04.09.2002 Umweltinformationsgesetz - UIG vom 23.08.2001	Umweltaudit-Zulassungsverfahren – UAGZVV vom 12.09.2002 Umweltaudit-Erweiterungsverordnung - UAG-ErWV vom 03.02.1998	Richtlinien für das Planfeststellungsverfahren zum Ausbau oder Neubau von Bundeswasserstraßen - PlanfR-WaStrG (VV-WSV 1401), Teil B: Umweltverträglichkeitsprüfung an Bundeswasserstraßen	Relevant for DM from capital dredging projects. There is general guidance about the demands for the permit but no specific criteria for dredged material. For the URE (Environmental Risk Evaluation) which is a governmental planning instrument for the development of waterways criteria for sediments and DM were developed recently.	

Annex III: Legal framework for the management of (C)DM in the Netherlands

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Preface

In the minutes of the second meeting of the Dutch-German exchange about criteria for the handling of dredged material, held on 7 and 8 June 2000, it was concluded that papers on four subjects should be prepared. One of those subjects is the national legislation with regard to dredged material. The paper will be discussed during the third meeting on December 13 and 14 in Bonn. After discussion this paper has been updated.

This paper contents:

- a. A description of Dutch legislation including some definitions
- b. Implementation of the EU-landfill directive
- c. Recent developments

Table 1 Dutch Policy-documents on water management (1 Page)

Table 2 Dutch acts/ordinances/directive's relevant to dredging (2 Pages)

A. Legislation on management of DM in The Netherlands

1. Introduction

The Netherlands are situated in the delta of the rivers Rhine, Maas and Schelt. Since the middle-ages regulation of the surface water systems took place. In the regulated water systems periodical dredging is needed in order to maintain the functionality of the water systems. Since the recognition of environmental problems in The Netherlands policy's and legislation were developed in order to solve the problems. At first the approach of the environmental problems was focused on different environmental compartments (soil, water, air), but since interaction between the three compartments is evident efforts are made to develop an integral environmental policy and subsequent legislation. It is possible to implement a directive on the handling and management of CDM in the Dutch (integral) Environmental Management Act. However in the present situation there are still different Dutch policy's and acts relevant for the management of dredged material. In this paper the relevant policy's, acts and procedure's for the handling of dredged material are described in short.

2. Policy on water management in The Netherlands

The strategy and goals of Dutch water management, including the management of aquatic soils, are described in National Policy documents on water management. Source control (reduction of emission of pollutants) as well as management of the contaminated systems are taken into account. The quality of the diffusive contaminated aquatic soils is judged by comparing total amounts of contaminants in the sediment with quality standards. Depending on the most abundant contaminant the contaminated aquatic soil is categorized as class I, II, III or IV. If all contaminant-concentration are below the target level the sediments are not polluted and categorized as class 0.

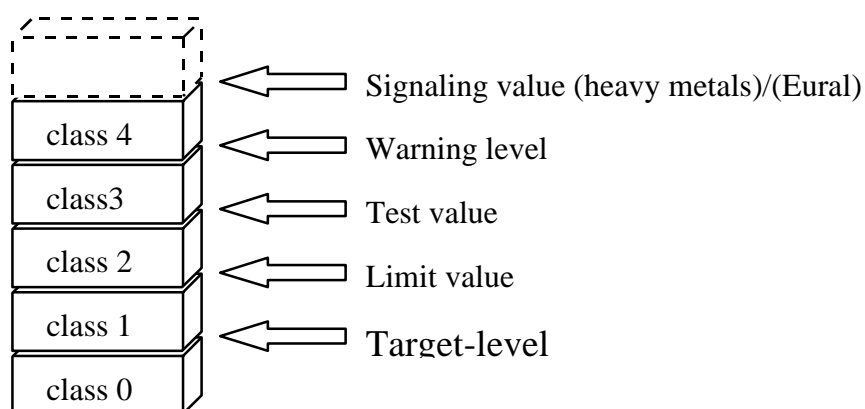


Fig 1: Classes of DM and differentiating Dutch values

In the third policy document (NW3), published in 1989, the contamination of aquatic soils was recognised as an important issue also because it hindered the execution of (maintenance) dredging projects. Realisation of 5 large scale Confined Disposal Facility's (CDF) (f.e. in lake Ketelmeer and Hollandsch Diep) was mentioned as an important measure for solving the problem of contaminated aquatic soils. Also the development of environmental friendly dredging- and treatment techniques was stimulated. In 1994 a supplementary policy document was made

(ENW). Also in 1994 a specific policy was made in order to regulate the removal and handling of (contaminated) dredged material. This policy was laid down in a document known as the Governmental Policy on the Removal of Dredged Material (Beleidsstandpunt Verwijdering Baggerspecie: BVB). This document also contains a directive for CDF's.

In the year 2000 the fourth policy document (NW4) was published. The problem of contaminated aquatic soils is currently handled with according to the strategy and goals for water management as described in the fourth policy document and the document on the removal of dredged material. The content of those documents is described in the next paragraphs.

2.1 Governmental policy on the removal of dredged material (BVB) (1993-1994)

For most surface waters in The Netherlands periodical (maintenance) dredging is needed in order to keep the functionality (shipping, discharge of rainwater) of the water systems intact. The top layer of the sediments present in the Dutch water systems is often polluted (class I, II, III or IV). The policy document gives an outline on the handling of the different classes of contaminated dredged material. In general the relocation in surface water or on land (alongside the waterways) of class I and II sediments was permitted for a certain period. If source control should lead to an improvement of background concentrations and if sufficient storage capacity (CDF's) is realised the relocation of class I and II sediments will no longer be tolerated.

The Pollution of Surface Waters Act forms the legal framework for relocation of Dredged Material in surface waters. For the relocation, permits are needed. Permits will only be given if background concentrations in the water system are comparable to or equal to the quality of the sediments that will be relocated. Relocation of dredged material in the North Sea (Noordzee) is permitted if sediment-quality meets the requirements of the so-called "content-test" (gehalte toets). Quality standards, also for the "content test", are given in the fourth national policy document (NW4).

The Environmental Management Act (WM) (hoofdstuk afvalstoffen en Besluit vrijstelling stortverbod) forms the legal framework for relocation on land.

Relocation of class III and IV sediments is regarded to be intolerable from an environmental point of view. Class III and IV sediments have to be treated or disposed in CDF's. As mentioned before a directive for CDF's is part of the Governmental Policy on the removal of dredged material. This directive is based upon an Environmental Impact Assessment study (1992 en 1993) and contains goal directed prescriptions (doelvoorschriften) instead of well-defined measures (middelvoorschriften).

2.2 Fourth National Policy Document on Water Management (NW4) (2000)

Main theme's of the Fourth National Policy Document on Water Management, Government Decision (NW4, 2000), are Flood protection, Water Depletion, Emissions and Aquatic soils. Dredging is relevant to the theme's "Flood protection" (capital, maintenance and remedial dredging) and "Aquatic soils" (remedial dredging) and partially to "Emissions" (remedial dredging if sediments act as a diffusive source of water-pollution).

In the National Policy Document standards are given for surface water-quality and sediment quality.

(See figure 1). Also risk levels for surface waters and sediments are defined (MTR). Most of the quality standards for sediments are made part of the Soil Protection act (Wbb). However the most important legal instruments for water quality management in The Netherlands are the Pollution of Surface Waters Act (WvO) and the Seawater Pollution Act (WvZ).

3. Acts and legislation relevant to dredging in The Netherlands

The most relevant acts in The Netherlands on handling dredged material are the soil protection act, the Pollution of Surface Waters Act/Seawater Pollution Act, and the Environmental Management Act. Those acts will be discussed shortly in this chapter. The General Act on Administration (Algemene wet bestuursrecht) directs the pathway of governmental decision-making. Decisions based upon the acts described in the next chapters have to be made according to the procedures of the General Act on Administration.

3.1 Soil protection Act (Wbb)

Main goal of the soil protection act is the prevention of pollution of soils (aquatic and terrestrial) and remediation of polluted soils. In general the starting point of this act is that the “polluter” has to pay for the measure’s that have to be taken (renovation and prevention).

In order to protect the soils the act makes it possible that general rules can be prescribed in so called “general governmental decisions” (algemene Maatregelen van Bestuur, Amvb). In 1997 the act was supplemented with specific rules for remedial dredging (Stb. 1997, 156). In this way authority was

given to the water quality-manager and financial aspects were arranged. Also quality standards (target-levels and intervention-levels) for soils and groundwater are defined in the act. In case of dredging of heavily polluted sediments a permit given by the water quality-manager is needed.

If dredging projects are planned the act gives the water quality manager the authority to demand an *inventory study* on sediment quality (OO). The initiator of the project has to carry out the study. If the sediments appear to be polluted (exceed target levels) a *follow up study* has to be done in order to demarcate the polluted sediments (NO). This follow up study must give answer to the following questions:

- do the polluted sediments form a so called “serious case of pollution” (ernstig geval van bodemverontreiniging) ?
- is remedial dredging of the “serious case of pollution” urgent (risk-evaluation) ?

If intervention levels are exceeded in more than 25 m³ the “case of pollution” is called serious, and a risk-evaluation has to take place. The *risk-evaluation* has to qualify the following risks:

- The risk of leaching of pollutants to the groundwater,
- The risk of dispersion of the contaminated sediments in the surface water
- The risk for humans (toxicology) (assessed with the model Sedisoil)
- The risk for the ecosystem (ecotoxicology) (assessed by means of Triade: chemical, bio-assays, field observations)

The way in which the study's and the risk evaluation have to be carried out is described in specific guidelines. Depending on the results of the risk-evaluation the urgency for remedial dredging is appointed.

In order to get a permit the initiator also has to give insight in the way the remedial dredging will be executed. By executing *a study on the possibilities for remediation* (remedial dredging) (SO) the most appropriate method for reconstruction of the aquatic soil has to be appointed. This method must be described in a *renovation plan (SP)*, based on which a (one of the) permit(s) for the operation can be given. Also the handling (treatment, disposal) of the contaminated dredged material (CDM) must be described in the renovation plan.

3.2 Pollution of Surface Waters Act/Seawater Pollution Act (WvO/WvZ) (1970)

Main goal of the Pollution of Surface Waters Act (1970) is the prevention of pollution of surface waters and restoration of polluted water systems. The Pollution of Surface Waters Act prescribes that permits are needed for all (waste) water discharges taking place on surface waters. In most cases treatment of wastewater will be prescribed in the permits. As a result of the Pollution of Surface Waters Act, many treatment plants for domestic and industrial waste water were build. The implementation of the act was made possible by levying of taxes on water-use, and has led to a significant improvement of water quality in The Netherlands. To ensure that the act can be broadly implemented definitions of (waste-water) discharges and surface water are not very strict.

Surface waters are defined as follows (1982):

“A, not incidental, mass of water (including the waterbed in which the water is temporarily present) bordering the surface of the earth and the air, unless no normal ecosystem is present in the water as a result of legal use for a specific goal (depot IJsseloog f. e.)”

(Aquatic soils are defined in the Soil Protection Act as soils beneath surface water. Because of this definition of surface waters all soils present outside of dikes can be defined as aquatic soils)

The protection of aquatic soils is an aspect that lies within the scope of the water protection act (also in the soil protection act). The consequences of (waste) water discharges on surface waters for the aquatic soil can be taken into account when permits are made. Since 1987 prescriptions relevant to sediment quality are made part of permits. However the prevention of pollution of sediments is not the main goal of this descriptions, but it ensures that the costs for eventual necessary remedial dredging projects can be passed on to the licensee.

For dredging projects permits based upon the Pollution of Surface Waters Act are needed in case of:

- Relocation of class I and II dredged material in surface waters
- Dredging of polluted sediments of class III and IV (In some cases, f.e. dispersion of polluted sediments in surface waters, renovation can be required because of the Pollution of Surface Waters Act. In that case the Pollution of Surface Waters Act has priority on the soil protection act.)
- All point sources of (waste) water disposal (permits can also be needed for other sources of water pollution).

3.3 Environmental Management Act (WM) (1993)

Decision on Facility's and permits

The Environmental Management Act is kind of a framework that will be filled in by “general governmental decisions” for specific topics. One of the goals of the Environmental Management Act is to integrate the different old acts relevant to the environment. The Environmental Management Act prescribes that regional governments have to make regional Environmental Management Acts (Provinciale milieuverordening, PMV) in which the former regional acts relevant to the environment have to be integrated. In this manner the environmental policy is partly implemented in order to realise the goals.

Central concept in the act is the “facility” (inrichting). Starting point is that it is prohibited to build, change or operate a facility, unless a permit is given (art 8.1). A facility is defined as:

“Every by man undertaken economic activity, or activity that is undertaken in such dimensions that it could be regarded as an economic activity, that takes place in between certain geographical boundary's”

An important governmental decision is the decision on facilities and permits (Inrichtingen en Vergunningen Besluit: IVB). In this decision the facility's for which the Environmental Management Act is relevant are mentioned. CDF's are mentioned in this decision. Also prescriptions for permit requests are given in this decision. In general regional governments decide about permit requests.

- **Waste material**

In 1994 a chapter concerning waste material was added to the act. At the same time the former waste act was cancelled. General goal of this chapter is prevention of the generation of waste. The definition of waste is linked to the international directive's and is more or less as follows:

“All substances or products, the withholder will dispose off”

In general, disposal of waste has to take place in a facility. However by a governmental decision (besluit vrijstellingen stortverbod buiten inrichtingen) an exception is made for certain categories of waste, and also a directive on the classification of dredged material (maintenance dredging) is part of the act (regeling vaststelling klasse indeling onderhoudsspecie, 1993). In this way relocation of class I and II dredged material is allowed, but only if the dredged material is originating from maintenance dredging projects. No exception is made for dredged material of classes III and IV. This dredged material is regarded as waste and has to be disposed in facilities.

Decision on hazardous waste/European list of hazardous waste (EURAL)

In the governmental decision on hazardous waste (BAGA) values are given for different pollutants. If those values are exceeded in waste (also dredged material), the waste is regarded as hazardous. Facilities for the disposal of hazardous waste have to meet very strict standards, and differ from facilities for “normal waste”. In 2002 the governmental decision on hazardous waste is replaced by the European list of hazardous waste (EURAL).

Decision on Environmental Impact Assessment (EIA)

The decision on Environmental Impact Assessment (EIA) (besluit m.e.r) is another important aspect of the Environmental Management Act. For certain kind of facility's (f.e. a CDF > 500.000 m³) it is prescribed that an EIA-study has to be part of the request for a permit based upon the Environmental Management Act. Also is prescribed in which way the EIA-study has to take place. Like mentioned before a directive for large-scale disposal facility's for dredged material is part of the governmental decision on removal of dredged material (BVB). If a disposal site for dredged material is closed (after exploitation) the government is responsible for the aftercare. The legal basis for the "aftercare" is given in a specific Act (Leemtewet). The necessary financial means for the activities during the aftercare have to be generated during the exploitation of the disposal facility by levying of taxes.

Treatment of dangerous waste (BAGA) is also an activity for which an EIA-study has to take place.

Building Materials Decree (also explained in Annex V)

The use (on land and in water) of secondary construction materials (excavated soil included) is regulated by means of the "Building Materials Decree (BMD, Bouwstoffenbesluit)". This decree was made to ensure that use of secondary construction materials (in this paper sand and soil) will not influence soil- and water quality, and therefore it is linked to the Soil Protection Act and the Pollution of Surface Waters Act. Depending on the total amounts of contaminants and the amount of contaminants that can leach out of the material three categories of secondary building materials are defined:

- Category 0 : clean earth (below target values), can be used freely
- Category I : can be used if emission/leaching does not exceed the tolerable value's
- Category II : can be used only within restrictions. The material must be used above groundwater level and has to be isolated from the surrounding soil to ensure that the material can be removed separately. Further emission/leaching may not exceed tolerable values. If necessary isolative measures must be taken to minimise infiltration and subsequent emission/leaching.

If the material doesn't belong to one of the three categories it is regarded as waste and has to be disposed of in a facility. Category 1 and 2 materials have to be removed out of a construction if maintenance has stopped and the construction has no function anymore.

3.4 Regional environmental act (PMV)

Because of the Environmental Management Act regional governments have to make a regional environmental act (PMV) by which the environmental policy is partially implemented. These regional environmental acts are in some extent relevant to dredging projects. If the dredged material has to be regarded as waste, the regional act gives regulations about the transport of waste (dredged material). Transport of waste is only allowed if registered. (afvalstroomnummer en transportgeleidebiljet). In a permit for a disposal facility for dredged material it is prescribed that a plan has to be made in which the procedure for accepting shipments of dredged material is described (acceptatieplan). Those plans must also reveal how the registration and control will take place. The plan must meet the requirements of the regional environmental act.

3.5 Act on Environmental Taxes (Wbm)

Because of the Act on Environmental Taxes (Wet belasting op milieugrondslag), taxes must be paid for disposal of waste materials in order to reduce the volume of waste and to stimulate the reuse of waste by treatment of waste. This act is relevant to the disposal of terrestrial soils and from 2002 also to the disposal of dredged material in facilities. If terrestrial soils or dredged material will be disposed it must be testified that the soil cannot be treated. A specific organisation (SCG) is responsible for the judgement on this item. For aquatic soils/dredged material the sand content of the dredged material determines the “treatability”. If the sand content of the Dredged Material exceeds 60%, the dredged material is regarded as “treatable”. Simple treatment techniques (sand separation basins/hydro cyclones) have to be used to separate the sand from the dredged material. Goal is to reduce the amount of dredged material that has to be disposed but also the production of secondary construction materials. If the withholder decides to dispose treatable dredged material a tax of 13 Euro has to be paid for every ton dry matter. The government is considering if other low cost treatment techniques (such as ripening, biological treatment) can be made part of the Act too.

A monitoring programme is executed to evaluate the aims of the Act and to evaluate if the increasing costs for disposal will not hamper the necessary maintenance and remedial dredging projects.

4. Summary

Since this paper is meant to compare Dutch and German legislation on dredged material a summary is given. For different aspects of a dredging project the relevant legislation is mentioned.

A technical framework for Contaminated Dredged Material is given in the PIANC report of Working Group 17 - PTC1 in the supplement to Bulletin no. 89 1996. A Dredged Material Assessment Framework (London Convention) is given in the PIANC report of Working Group 1 - PEC, "Management of Aquatic Disposal of Dredged Material, 1998". Based upon those frameworks the following aspects of dredging projects have been distinguished:

- a. Need for dredging
- b. Dredged material Characterisation
- c. Source Control (source of pollution)
- d. Dredging
- e. Relocation and transport
- f. Treatment and re-use
- g. Disposal

a. Need for Dredging

Dredging can take place for different reasons. Capital dredging projects, Nautical dredging projects and Remedial dredging projects can be distinguished. Those types of dredging projects will also have different goals. For capital and maintenance dredging main goal is to create a certain water depth. Main goal for remedial dredging projects is to improve the aquatic environment.

For remedial dredging projects a permit based upon the soil protection act is always needed. In fact the soil protection act (and in some cases the Pollution of Surface Waters Act) prescribes the remedial dredging. Also a permit based on the Pollution of Surface Waters Act will be necessary.

If polluted sediments will be removed during capital or maintenance dredging a permit based upon the soil- and water-protection act will be necessary.

b. Dredged material characterisation

Dredged material characterisation should take place before the dredging is executed. The characterisation is necessary for permit requests based upon the soil- and Pollution of Surface Waters Act. Quality standards are given in the fourth policy document on water management and in the soil-protection act.

c. Source control

Dredging of polluted sediments is only meaningful if the sources of water-pollution are controlled. In the Dutch situation the water-protection act has proven to be very effective in source control. However newly formed sediments in The Netherlands are often still polluted (mainly class I,II).

Source control is also one of the goals of the Environmental Management Act and the soil protection act.

d. Dredging

As mentioned, if dredging of polluted sediments takes place, permits based upon the soil protection act and the Pollution of Surface Waters Act will be necessary. In the soil protection act permit it is defined which amount of polluted material will be removed, and how the goal of the project will be evaluated. In the permit based upon the water-protection act prescriptions on water quality (turbidity) are given.

If it's expected that the dredging project will cause hindrance in an other way (sound f.e.) also permits based upon local environmental legislation will be needed.

e. Relocation and transport

If the dredged material is classified as class I or II the material can be relocated in the surface water or on the terrestrial soil alongside canals. Permits based upon the water- or soil-protection act are necessary for this activity.

f. Treatment and re-use

Treatment of dredged material has to take place in a facility for which a permit based upon the Environmental Management Act is needed. If treatment of hazardous waste takes place also an EIA-study has to be done.

Re-use is allowed if the (treated) material meets the criteria formulated in the Building Materials Decree (bouwstoffenbesluit). Permits are needed for the construction in which the (treated) sediments will be used.

g. Disposal

In case of disposal of dredged material the shipment has to be accepted at a disposal facility. Based upon the permit (Environmental Management Act) for the disposal site, every disposal facility is obliged to make an "acceptance-plan". The plan gives the criteria that have to be met by the shipment of dredged material (waste). In most cases the dredged material characterisation that has been done according to the directive's of the soil protection act are used to characterize the shipment. The transport has to be regulated according to the regulations in the regional environmental act.

Disposal sites for dredged material also need a permit based upon the water-protection act since (waste) water is discharged from the disposal site.

B. Implementation of the EU-landfill directive

The EU-landfill directive is relevant to the disposal of waste in landfills. Since dredged material is regarded as waste the EU-directive is also relevant to CDF's for dredged material. In the directive the use of specific isolative measures is prescribed. In this way the specific characteristics of dredged material are not taken into account.

• Dutch directive for CDF's for dredged material

Within the Dutch legislation there a directive for Confined Disposal Facility's (§ 2.1) is in use from 1994. This directive is based upon an Environmental Impact Assessment study (1992 en 1993) and contents goal directed prescriptions (doelvoorschriften) instead of well-defined measures (middelvoorschriften). In this way the specific characteristics of the dredged material can be taken into account during the making of the design of a disposal facility. General goal of the directive is to prevent emissions from the CDF to the groundwater according to the ALARA-principle. The emission to the groundwater is judged by modelling the geohydrology and contaminant-transport. Three criteria have to be judged:

1. Pore water concentrations in the facility have to be compared with the target levels for the groundwater (soil protection act);
2. If pore water exceeds the target-levels for the groundwater the flux of contaminants (g/ha/yr) has to be calculated and compared with the target-fluxes given in the directive;
3. If the target fluxes will be exceeded isolative measures have to be taken (ALARA) in order to ensure that the facility will not pollute a large volume of the aquifer. Maximum volume that after 10.000 years is allowed to be polluted (above the target-levels) is as big as the storage-volume of the CDF.

For a specific CDF in The Netherlands, a permit based upon the Environmental Management Act is needed. In the request for a permit model-calculations must show that the criteria of the Dutch directive will be met. The request for a permit has to include an environmental impact assessment. The prevention of emissions to the surface water is regulated with a permit based upon the Pollution of Surface Waters Act.

• Implementation of the EU-Landfill Directive in Dutch legislation

Since the EU-directive is relevant to disposal facilities on land only, a governmental directive for disposal facility's for dredged material on land only (and above groundwater) was made in The Netherlands, and came into force in 2001. The content of the directive is very much the same as the directive that is part of the governmental policy on the removal of dredged material (BVB). This means that again goal directed prescriptions (doelvoorschriften) instead of well-defined measures (middelvoorschriften) were used to ensure the protection of the environment to minimal the same extent as the EU Landfill Directive demands. In this way the specific characteristics of the dredged material will be taken into account during the making of the design of a disposal facility on land.

In the recent past most large-scale disposal facilities for dredged material in The Netherlands were build in surface water systems. The EU-landfill directive does not prohibit this since the "deposit of non-hazardous sludges in surface waters including the bed and the subsoil" is excluded from the scope of the EU Landfill Directive. The making of a governmental directive for

disposal facility's for dredged material both on land and in water is under consideration. Such a directive should be made part of the Dutch Environmental Management Act and could replace the old directive (BVB) and the newly made directive for disposal sites for dredged material on land only. Because of the recent political pressure to increase treatment of dredged material and to reduce the disposal of dredged material in CDF's, Dutch politicians are not convinced about the need for such a directive (see also recent developments).

C. Recent developments

- **Treatment**

At the moment treatment of contaminated dredged material is taken in consideration again. Results of pilot projects could lead to the conclusion that more dredged material has to be treated instead of being disposed in facilities. Starting in 2002 the Act on Environmental Taxes applied to dredged material. This Act is regarded as an instrument to reduce the amount of dredged material that has to be disposed in CDF's.

If dredged material meets the criteria for treatability (sand content), as mentioned in the Act on Environmental taxes, the material has to be treated or taxes have to be paid if this material will be disposed in facility's. In this way the costs of disposal (for certain amounts of dredged material) increase and will be closer to the costs of treatment.

As another instrument to stimulate treatment of contaminated dredged material a (temporal) provision is in preparation to subsidize more sophisticated treatment techniques.

In general Dutch Watermanagers are afraid that treatment of DM will lead to much higher costs for dredging projects. As also mentioned in chapter 3.5 a monitoring programme is executed to evaluate the aims of the Act on Environmental Taxes and to evaluate if the increasing costs for disposal will not hamper the necessary maintenance and remedial dredging projects.

- **Soil protection act**

In the soil protection act rules are given on how to execute remedial dredging projects. In general the goal of remedial dredging projects is to restore all functionality's of the aquatic soil (target levels), unless background concentrations make this impossible. However at the moment it is investigated if it is possible to adjust the soil protection act. The adjustment will have to change the goal of remedial dredging projects. The goal of remedial projects should be: restoration of the aquatic soil in such a way that it is suitable for the planned functions of the aquatic soil. Such an adjustment of the soil protection act could lead to restoration plans in which the measures are dependent on the risks originated by the polluted aquatic soil. In certain cases capping of contaminated sediments could be a measure for restoration of sediment quality. If the soil protection act will be adjusted in this way the number of remedial dredging projects could decrease and also the amount of CDM that has to be treated or disposed. Improvement of methods for risk-assessment is also topic of study.

Dutch Policy documents on water- gement	Contents	Comments
NW4 (2000)* (4 th National Policy document on water management)	<p>Dutch policy on:</p> <ul style="list-style-type: none"> • Flood protection • Water depletion • Emissions and aquatic soils <p>Quality-standards</p> <ul style="list-style-type: none"> • surface water (risk-levels) • (freshwater) sediments (risk-levels) • saltwater sediments 	<p>Water systems (groundwater included) are the central concept</p> <p>Decisions about relocation of saltwater sediments have to be based upon the quality standards for saltwater-sediments.</p>
BVB (1994) (Governmental policy on removal of dredged material)	<ul style="list-style-type: none"> • Directive on handling of dredged material in inland waterways (relocation/disposal) • Directive for CDF's 	<p>Execution of the directive is only possible within legal framework of WVO, Wbb and Wm</p> <p>Directive for CDF is based upon an EIA-study</p>

* Regional water-authorities are responsible for making policy documents on regional scale. Those documents are mainly relevant to local waterways. (waterhuishoudingsplan)

Table 1: Dutch Policy-documents on water management (1 Page)

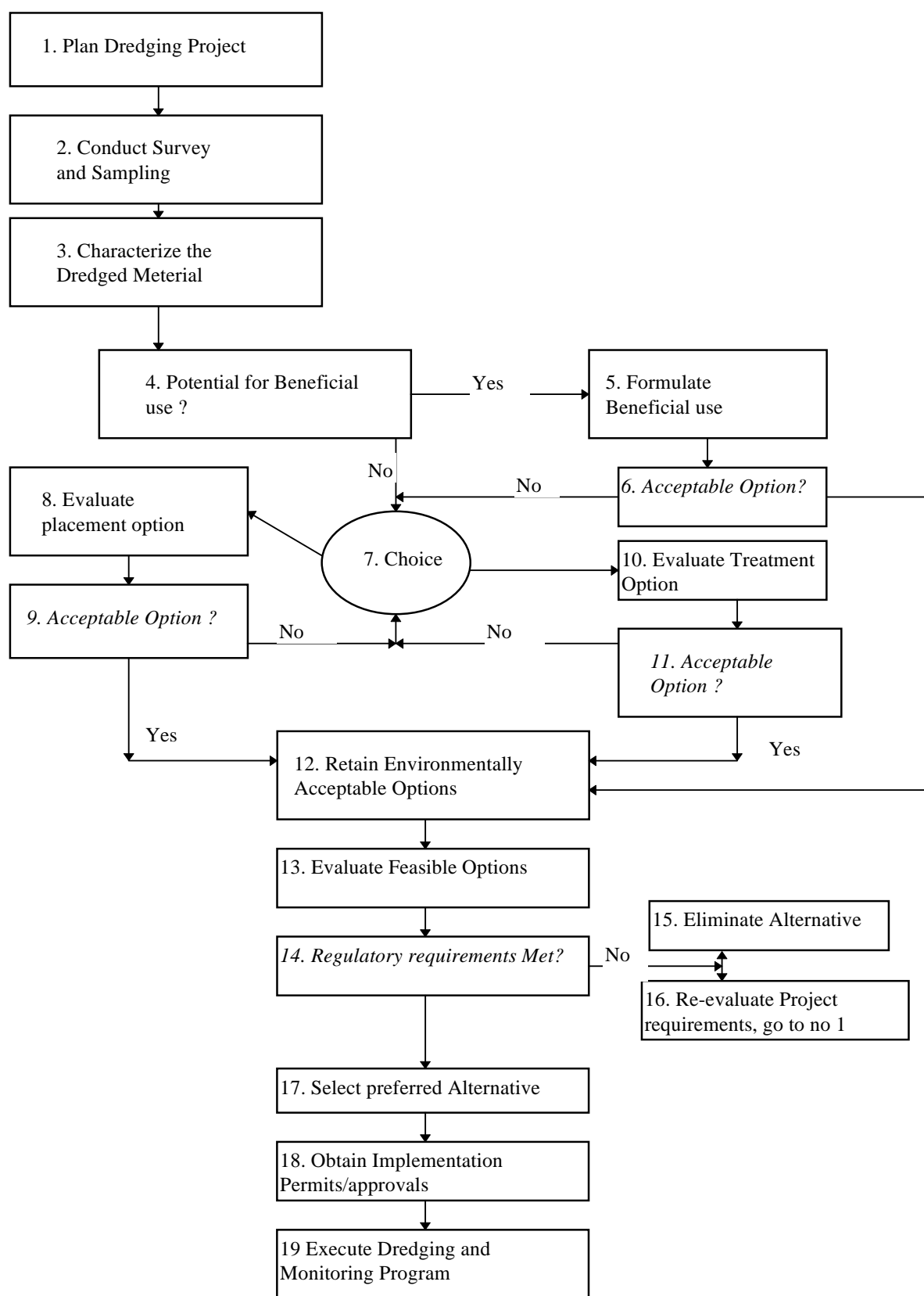
Dutch Acts/Directives /Ordinances	Contents	Comments
Acts		
Awb (General act on governmental administration) (1994)	Regulates administrative procedures (permits) and assigns competent authorities	Procedures necessary because of the Wbb, WvO, WvZ and Wm have to take place according to this act.
WVZ (Sea water protection act) (1970)	Regulates the relocation of dredged material in coastal (salt)water	Relocation of dredged material is permitted if quality does not exceed the quality standards for salt-water sediments (NW4)
WvO (Pollution of Surface Waters Act) (1970)	Instrumentation for water-quality management, regulates discharges on the surface water	Remedial dredging can be imposed by the water quality authorities.
Wbb (Soil protection act) (chapter on remediation of polluted soils since 1994)	Purpose is the protection of soils, sediment and groundwater. Regulates handling and remediation of contaminated soils (aquatic soils included) and prevention (protection of the soil against degradation and contamination. There are quality standards for soil and groundwater, but they are not yet included in the Act, .	Before removing any soil field-investigations on sediment quality have to be carried out. Different guidelines on field-investigations exist.
WM (Environmental Management act) (1993)	Different ordinances (amvb) on environmental protection. <ul style="list-style-type: none"> • decision on facility's and permits • chapter concerning waste • decision on hazardous waste • decision on environmental impact assessment • General administrative order on construction materials 	Provides a legal framework for governmental decisions on environmental issues. Implements the existing waste regulations (national and EU) Permits for disposal facility's for dredged material are needed. EIA-study's are necessary for: <ul style="list-style-type: none"> • CDF's > 500.000 m3 • Facility's for treatment of hazardous waste
Ordinances/directive's		
PMV (regional ordinance's on environmental protection)	Regulates handling (shipment) and management of waste (DM included)	Implements Wm in regional legislation
BVB (Policy document on removal of dredged material and directive for CDF's) (1994)	Regulates the relocation of dredged material in freshwater directive for CDF's	For a certain period quality-classes 0,I and II can be relocated in surface waters or alongside the waterway. Quality classes III and IV have to be disposed in CDF's
BSB (general administrative order on construction materials) (1995)	Regulates the use of construction materials, Standards for quality of construction materials and emission of contaminants (elutriate).	Chemical quality (dry matter and elutriate) of soils to be re-used is decisive. Categories are: clean material, category I, category II, waste In general DM of quality class IV is regarded as waste and cannot be re-used.
Wbm	Stimulates the prevention of the production of waste and stimulates the	Based upon prevention- beneficial use - disposal.

	use of secondary construction materials by levying of taxes on disposal of waste. Also environmental legislation on landfills and industrial plants.	Soils have to be judged on treatability. If treatable disposal is taxed. Dm is judged as treatable if it consists of > 60% sand. Tax is € 13 per year.
Directive for upland disposal of DM (2000)	Content is very much the same as the directive that is part of the BVB	Does not apply for CDF's in water systems
Guidelines		
Guideline for inventory survey/investigation (Protocol oriënterend onderzoek)	Rules on how to execute inventory field investigations on soil/sediment quality	Sampling and analysis strategy
Guideline for further investigation/survey (Protocol nader onderzoek)	Rules on how to execute further field investigations on soil/sediment quality	Sampling and analysis strategy
Guideline to investigate the priority of remediation (Urgentie-systematiek)	Rules on judging the hazards of contaminated soils	Model sedisoil and Triade are used to quantify risks for: humans, ecology and dispersion to the surface- and groundwater
Guideline for remediation survey/investigation (Sanerings-onderzoek)	Rules on how to execute field investigations on soil/sediment quality and restoration options	At least two restoration options have to be compared
NEN	Methods for chemical analysis for different contaminants and methods for characterisation of soils	NEN guidelines are comparable to DIN guidelines

Table 2: Dutch acts/ordinances/directives relevant to dredging (2 Pages)

Technical framework for Contaminated Dredged Material

(PIANC report of Working Group 17 - PTC1 supplement to Bulletin no. 89 1996).



Annex IV: Dutch environmental soil protection policy and the application of treated dredged materials

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Introduction.

This paper will explain the current Dutch policy for the protection of soil and surface waters as far as Dredged Material (DM) is concerned. It will also look into the near future for trends in Dutch policy concerning DM.

In *figure 1* different options for the handling of DM are illustrated, to give an overview. All the options are interrelated. This paper will focus on the application of DM as (raw material in) building materials, and also on the use of DM as earth in construction works. In The Netherlands DM is considered earth¹. Earth can be used as a building material in earth works. Dutch policy differentiates in the use of DM (or earth) in construction works where the DM is not allowed to mix with the underlying soil, and the use in earthworks that may mix with the underlying soil and become part of the ecosystem of the soil. The use in construction works is regulated in the Building Materials Decree; the use as soil is regulated in a Soil Management policy, formulated as exemption to the BMD.

The Building Materials Decree is general legislation for the use of earth, DM, stony building materials. It is based on preventive soil protection policy that aims at limiting the load of pollutants into the soil as far as reasonably achievable (source orientated policy; avoid unnecessary pollution). It also protects groundwater and surface water. In the BMD earth or DM is considered a source of pollution if it is not clean.

Soil management policy is especially developed to create environmental sound conditions for the practical use of lightly contaminated excavated soil (earth) and dredged sediments into the soil, considering the fact that many soils in the Netherlands are not clean, but also lightly contaminated as a result of historical pollution. This policy is based on the *stand still principle* to avoid further deterioration of the soil quality (to keep clean soil clean; to avoid further pollution of contaminated soils). At the moment this policy is restricted to the use on land. A soil management policy for the wet environment will be developed the next years. It is meant to be an alternative to the spreading of lightly contaminated DM as it is allowed now.

At the moment much of the contaminated DM is disposed of in landfills on land or under water. There is also legislation that permits the spreading of lightly contaminated DM from maintenance dredging in waterways. Spreading is allowed on land (DM-class 0-2² on a 20 meter zone near the waterway) and under special quality conditions under water. For heavily contaminated DM resulting from projects in the large rivers (now carried out to increase the water keeping and transporting capacity) there is a remediation policy to rearrange the contaminated DM within the projects. This policy keeps within the

¹ In Dutch policy soil is defined as: *the firm part of the earth with the liquid and gaseous components and organisms contained therein*. To distinguish between soil as a (eco)system and soil as excavated or dredged material to be used again, the term *earth* is used for the excavated (dredged) material and excavated soil. The term *soil* is used for the soil as (eco)system (the environmental compartment to be protected).

² Classification for DM is explained in appendix 1.

limit of current legislation, where relocation of heavy contaminated soil within a remediation site is allowed.

The Dutch government is aiming at the reduction of the landfilling of DM, and the stimulation of treatment and application (beneficial use) of DM. For lightly contaminated DM there is a preference for the use of cheaper and simpler techniques, like ripening, land farming, sand separation and stabilisation. This paper will elaborate on the environmental conditions and limitations for the application of (treated) DM set by the Dutch environmental soil protection legislation.

At the moment there are important discussions in The Netherlands going on that may result in the development of a new environmental policy for handling of (DM), or in changes in the current policy. Several research and policy projects have been carried out and now political choices have to be made for the future.

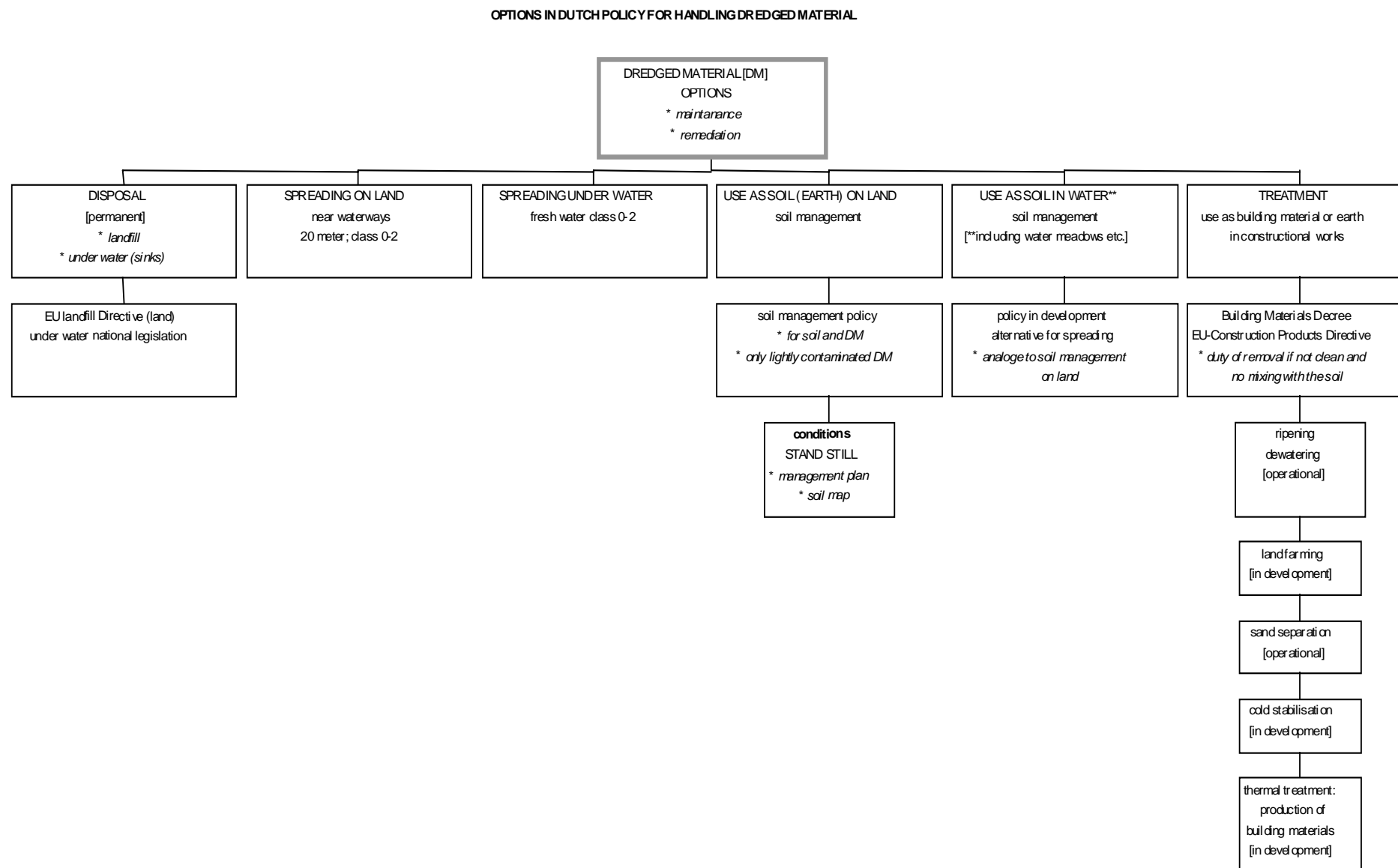


Figure 1: Options for handling dredged material.

Explanation:

‘Spreading’: relocation in thin layers (not in constructions or earthworks).

‘Use as soil on land’ in earthworks: Dutch policy now in operation; possibilities for reuse of Dredged Material are limited. A special policy for ‘use of DM as soil in water or on land’ is in development.

Dutch Building Materials Decree (BMD).**Introduction.**

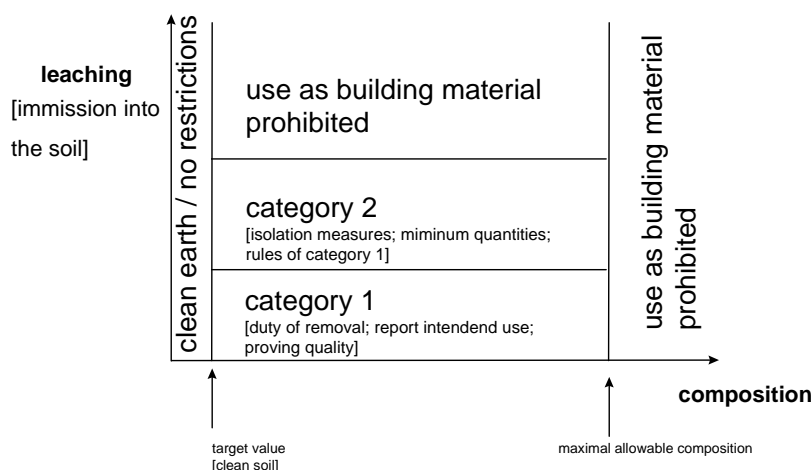
Excavated soil (earth) or dredged sediments can be used in two ways in Dutch policy:

1. As a building material in a construction work under the conditions of the BMD. For example the use in earthworks (noise reduction walls), road construction or dikes. The material has to be removed when the work is no longer used and may not mix with the underlying soil. Also the use products of treatment of DM, like bricks or artificial gravel have to meet the conditions of the BMD.
2. As soil under the conditions of soil management policy. For example to raise the surface or fill up holes in the landscape. The excavated soil is considered to become a part of the soil again. It may mix with the soil.

Clean earth may be used without any restrictions under the conditions in 1 and 2. This paragraph deals with the use of DM or earth under the conditions of the BMD. The next paragraph describes the use of DM or earth under soil management policy.

Short explanation of the BMD.

The BMD is general legislation for the use of stony building materials in the soil or in surface waters. The decree involves reusable *secondary* (waste) materials like ashes, slags and treated demolition waste) and *primary* materials (raw materials like sand, clay and gravel and products like concrete, asphalt) and also earth or DM. For earth and DM the BMD-rules are summarised in figure 2. The general rules are applicable independent of local soil quality. The BMD is based on the Soil Protection Act and the Pollution of Surface Waters Act.

Earth/dredged material and Building Materials Decree**Figure 2:****Earth/dredged material and Building Material Decree****Immission limit.**

Basis of the BMD is the limit for immission into the soil. This maximum permissible load on the soil is the so called *marginal soil load*. The starting-point for determining a maximum permissible load on the soil is that the multifunctionality of the soil must be guaranteed. As it is often impossible to employ building materials without some emissions to the soil, it was decided when drawing up this Decree to opt for a no more than marginal soil load on the assumption that this does justice to the starting point of maintaining multifunctionality. These values are for some parameters (like sulphate and fluoride) adjusted to guarantee a high level of reuse of secondary building materials. The environmental goals of soil and surface water protection are balanced with the environmental goal of stimulation of reuse and reduction of landfilling.

Marginal soil load means:

- a. a very slight increase in the contents of pollutants in the solid phase of the soil relative to the target values;
- b. protection of the groundwater at the level of the groundwater target values, for mobile substances like sulphate, fluoride, chloride, bromide.

The BMD uses leaching tests under laboratory conditions to get information on the potential immisions in the soil. See appendix 2 for more detailed information.

Conditions for the use of building materials.

For untreated (if necessary dewatered) DM³ and earth the BMD conditions are:

- ❑ If DM is clean there are no restrictions; if it is lightly contaminated DM may be used; if DM is heavily contaminated it cannot be used.
- ❑ Duty to remove the DM if the construction work has no function anymore (is no longer used). Prohibition to mix lightly contaminated DM with the underlying soil.
- ❑ The use of lightly contaminated DM in works has to be reported to the competent authorities. It has to be used in quantities of more than 50 m³; environmental quality of the DM can be proved by certification or by using batch inspection for leaching and composition according to the BMD protocols.
- ❑ If leaching is too high, isolation measures (isolation cap and construction above the groundwater level) are necessary to keep immission within BMD-limits and to protect groundwater (category 2). If composition or leaching is beyond the maximum limits, the use of DM is not allowed.
- ❑ For organic compound there is only a limiting composition value, because there are no suitable leaching tests available yet.

For the use of DM treated to become building materials (products) conditions are more or less the same. Differences are:

- ❑ There is no category for clean building materials, so target values are not used.
- ❑ There is no maximum composition value.
- ❑ No duty to report the use of category 1 material.

Limitations on using DM under the BMD

There is a lack of representative information on the quality of Dutch DM in relation to the BMD. So it is difficult to draw definitive conclusions about the use of DM in relation to the BMD. Products of thermal treatment techniques seem to meet the BMD-conditions for use as category 1 building materials. Also sand from sand separation can lead to a category 1 material. According to the experiences so far, the use of DM resulting from the more simple treatment techniques like land farming and ripening

³ DM is considered earth when used in wet conditions or after ripening or land farming.

frequently do not comply with BMD values. This is due to the leaching of sulphate, fluoride, chloride and the composition of mineral oil. Classification as category 2 makes large-scale application of treated DM difficult, because of obligatory isolation measures. At the moment the Dutch government is assessing the situation and reconsidering the balance between the environmental goals of soil protection on the one hand and the reduction of land filling of DM on the other hand. Due to the high quantities of DM in the Netherlands, this will be an important political discussion. This may lead to short term (interim) policy changes for lightly contaminated DM at the end of this year. Additional research may lead to more structural changes in policy, on the basis of sound scientific knowledge.

Sulphate, fluoride and mineral oil.

Sulphate, fluoride and chloride are mobile anions in the soil. Therefore the BMD has immission limits to protect contamination of groundwater. Groundwater is considered a important natural resource, e.g. for drinking water and it is important for the soil ecology.

Sulphate, fluoride and chloride in DM may have a natural origin, at least in aquatic soils. Sulphide might even be abundant in many Dutch sediments en soils, especially in clay fractions. Due to redox changes (due to the presence of organic matter and under the influence of oxygen during excavation and application) sulphide may transform in sulphate, depending on conditions at the application site. If under anaerobic conditions the balance is on the sulphide site the risks for groundwater may be low, because sulphide is immobile. It's not clear however under what practical conditions this is the case and when sulphate sensitive situations may occur. There are plans to do additional research to elaborate the mechanisms of this process in soils and in construction works. This research can be the basis of changes in legislation on the long term.

Chloride in DM may have a marine origin. DM with large amounts of chloride may be used in marine areas. The BMD has special limit values for the use in these areas.

Most other building materials than DM can meet BMD immission limits for sulphate, fluoride, chloride and mineral oil. The high leaching of these compounds in BMD leaching tests seems to be mainly restricted to DM. So, for the sake of soil protection it would not be wise to allow higher sulphate immission levels in the BMD for all building materials, as this would lead to unnecessary higher sulphate emissions from building materials (quality deterioration).

Mineral oil

Mineral oil composition values in the BMD are derived from the general quality of building materials. Mineral oil doesn't occur frequently in most building materials. Mineral oil is however more frequently measured in soils and in DM. Land farming and thermal immobilisation may be important techniques to reduce the mineral oil composition. The government has the intention to evaluate mineral oil values for DM in the BMD. A problem that arises is the lack of reliable data as a sound basis for a revision. Further research will be necessary.

EU Construction Products directive

Because there is European legislation, attention has to be paid to European and other international developments, especially in relation to the EU-Construction Products Directive and the EU-Directive on the Landfill of Waste Materials. Both directives regulate the use or disposal of materials using leaching criteria, for the CPD technical specifications, for the Landfill Directive: waste acceptance criteria .

In the EU legislation the Construction Products Directive (CPD) is operational to harmonise the market for building materials. For the environmental aspects of building materials in CPD technical speci-

fications (standards and technical approvals) will be made. These specifications like for example leaching tests for the environmental aspects of building materials have not yet been developed on a EU-level. When EU-specifications have been drawn up, member countries are obliged to implement these specifications in their national legislation. Until there are EU specifications, EU member states are allowed to have their own national specifications. In The Netherlands these specifications are laid down in the BMD. The BMD has been notified before publication.

Technical specifications of the CPD will mainly be developed within the framework of CEN, by mandate of the EC. Therefore co-operation in CEN and in the EU is important in order to develop practical procedures with a high quality and a wide field of application, with respect to materials and production methods. From the Dutch point of view, based on the experience with the development of the BMD, it would be much better to develop regulations and testing methods in a ‘horizontally’ oriented way. This way they can be used in all fields of construction and other materials like waste materials, while the development of different methods in each separate field of construction products results in a non-consistent situation for industry and consumers. Besides the fact that this would be counterproductive in the field of research and development, it will be very counterproductive in (environmental) legislation and lead to a situation where effective cost control in the testing of building materials is hampered.

Soil Management.

Current policy for soil management on land

The current policy for handling excavated lightly contaminated soil is primarily based on the principles of sustainable soil use. Reuse of excavated soil can reduce the need for primary, clean soil. The required soil quality is related to the type of land use in the soil management policy. Soil protection in this policy is mainly attained by complying with the stand still principle.

Background.

The historical pollution in the Netherlands can not be completely remediated. Soil remediation policy for old contamination has a functional and cost effective approach. We have to live with lightly contaminated soils, especially in the urban areas. The soil management policy has a practical location orientated approach. Under special conditions excavated contaminated soil may be used again, without complying to the BMD-rules. This policy is also applicable for the use DM as soil on land, though the quality of DM will not always meet the demands. Soil management policy is so far only developed for land and not for aquatic soils.

Soil management policy is laid down in a ‘*Earth moving exemption decision*’, which under conditions exempts the use of soil or earth from the BMD.

Soil management: Conditions

The basis of soil management is the continuous control of areas by the local authorities. Local soil qualities are registered in a soil quality map, where soil qualities are categorised in zones of comparable soil quality. Use of soil from comparable zones is allowed, as well as the use of soil with a proven comparable quality. Local authorities are free to implement this policy. They may also stick to BMD-rules.

The main conditions are summarised here:

- ☐ Clean soil: no restrictions for reuse.
- ☐ Lightly contaminated soil: reuse as soil allowed under conditions.
- ☐ Heavily contaminated soil: has to be treated or disposed of into a landfill.

The conditions for the use of lightly contaminated soil are:

- ❑ **Soil management plan**
Made by the local authorities.
- ❑ **Soil quality map**
Describes chemical quality of the accepting soil (using zones of comparable quality)
- ❑ **Stand still principle**
No deterioration of the quality of the accepting soil is accepted: only soil of a comparable or better quality may be used in a zone.
- ❑ **No risks;**
The application of soil may not lead to risks for the existing or planned functions of the local soil. For several functions, like living, industrial activities, agriculture and nature, there are special risk values derived. These values may not be exceeded.
- ❑ **Registration**
To keep the soil quality map up to date.

This policy is operational for several years now, and will be evaluated next year.

Soil management in water and aquatic systems

DM can be used as soil in the policy concept of soil management, but this can be difficult when the quality of DM is different from the local soil quality. It can be an alternative for the spreading of DM, as is allowed for DM resulting from maintenance dredging of waterways. According to this interim policy, it is allowed to spread this DM, if it is lightly contaminated (up to class 2) on a 20 meter zone near the water way. Development of soil management policy for water systems, analogue to the soil management policy for land use, is planned for the near future. It can provide more tailor made and location specific solutions.

Development of soil management policy for aquatic systems may also contribute to the environmental goals of stimulation of reuse and reduction of land filling.

Conclusion: towards an environmentally sound handling of DM in the future.

For a strategic approach to the solution of the problems with dredged materials in an environmentally sound way, it is important to consider the whole spectrum of options for handling DM. This spectrum is sketched in figure 1. Dutch policy aims at the reduction of landfill sites, especially for lightly contaminated DM, where reuse can be the alternative. The most promising policy developments in the Netherlands in the near future will aim at treatment of DM to produce building materials to be used under BMD conditions and the use of DM as soil under soil management conditions. Supporting research projects will be started and carried out in the near future.

To stimulate treatment projects and cleaning of DM, stimulation measures will be taken on the level of environmental taxes (see paper: *The Netherlands Environmental Tax on Waste*). Also extra funds are made available by the Dutch government for the next four years for projects on the field of treatment of DM (NLG 160 million). This is important, because so far treatment of DM is more expensive than disposing in landfills.

Additional information.

For additional information visit the English internet site of the Dutch Ministry of Housing, Spatial Planning and the Environment: www.minvrom.nl/soil

For general information on soil protection policy. Information on Dutch environmental values can be found on this site in: *Circular on target values and intervention values for soil remediation*.

For additional information on the Dutch Building Materials Decree. A translation in English of the Building Materials Decree can be downloaded from this site.

www.minvrom.nl/building

Email: herman.walthaus@minvrom.nl
wim.munters@minvrom.nl

Brochure BMD.

For the BMD there is a brochure in English available:
Number 00.0225/h/05-00 23021/211.
Ministry of Housing, Spatial Planning and the Environment,
Communications directorate,
P.O. box 20951,
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The Netherlands.

Appendix 1: Classification of dredged material.

Dutch system for classification of DM, based on composition values as used in Dutch environmental policy and legislation on DM. This system is not used in the BMD except for the use of the *target values*. The *target values* discriminate clean soil or DM from contaminated soil or DM. In the BMD for soil and DM, a combination of leaching values and composition values is used.

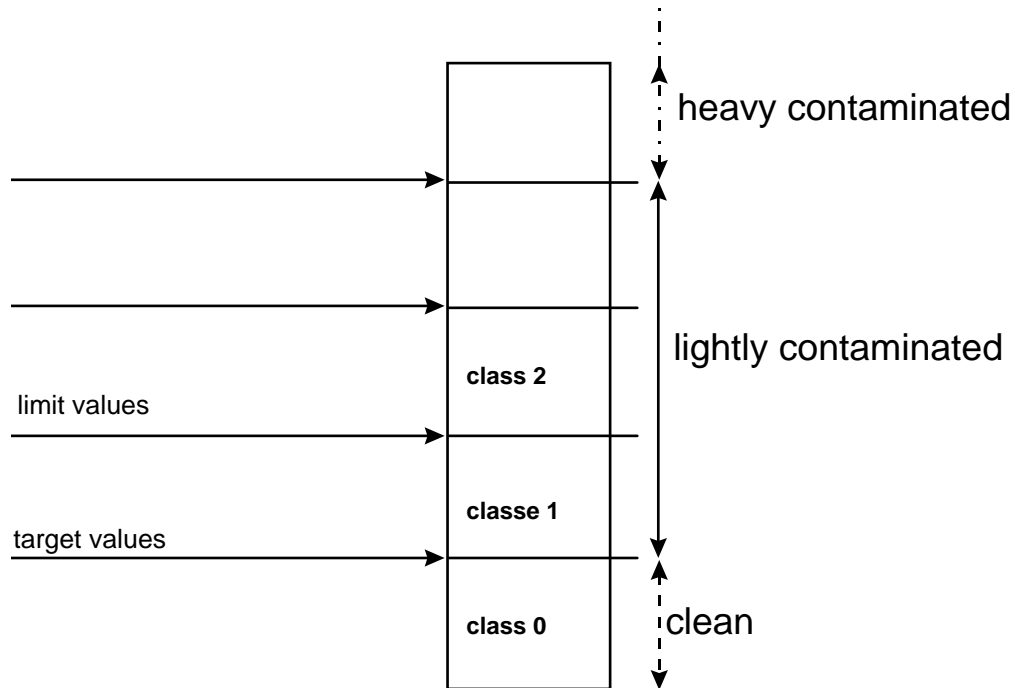


Figure 3: Classification of dredged material

Appendix 2: Immission values in the BMD.

The immission value depends on two factors: the leaching behaviour of a material and its proposed use. The difference between leaching and immission is explained in figure 5. The leaching (emission) is a fixed value; the immission depends each time on the circumstances, e.g. the temperature, degree of contact with water, presence of isolation measures and the height (thickness of the layer) at which the building material issued.

The immission value expresses how much of a substance will in practice actually end up in the soil. The immission value is established in two stages. First, the leaching from a building material (emission value) is measured in a laboratory using standard leaching tests. The emission values obtained in the laboratory are then converted with the aid of formulae into expected immission values in practice. Immission values have only been established for inorganic substances. No suitable leaching tests are available as yet for organic substances such as polycyclical aromatic hydrocarbons (PAH), mineral oils, pesticides and PCBs. Until these tests are developed the composition values are all-decisive for organic compounds and there are no critical immission values.

The regulations governing exemption from the composition and immission values of the Building Materials Decree were published in the Netherlands Government Gazette, no. 126, of 6 July 1999. The values given in these regulations replace the values stipulated in Appendix 1 and Appendix 2 of the Decree (as published in the Bulletin of Acts, Orders and Decrees no. 567 of 23 November 1995), retroactive to 1 July 1999.

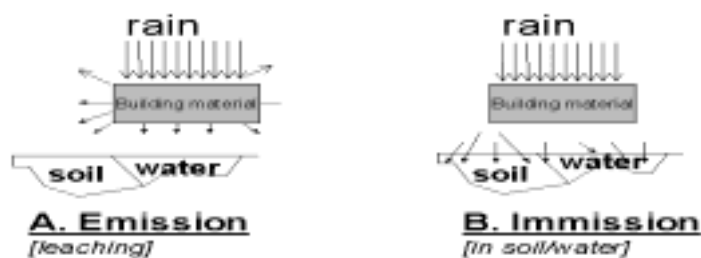


Figure 4: Emission/Immission.

- Emission [Leaching]: contact with rain or groundwater causes substances to be released from a building material.
- Immission into the soil (groundwater) or surface water [flow of substances]: as a result of leaching, substances released from a building material get into the soil or water.

**ANNEX V: Address-List of delegation members to the Dutch-German Exchange
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