Guidance on use of Disposal and Recovery Codes
(Waste Management Act, 1996 as amended)

This information is provided as a source of reference for operators completing waste surveys for the EPA. Under each of the disposal and recovery codes there are some examples of the types of activities that fall within the code, sourced from the *Manual on waste statistics'- a handbook for data collection on waste generation and treatment (2013 edition)*, Eurostat (http://ec.europa.eu/eurostat/web/waste/methodology).

D Codes		Description and Examples of Disposal Codes
D1	**Landfill**	**Deposit into or on to land, (e.g. landfill, etc.)** Deposit of overburden, waste rock and tailings on heaps in the extractive industry
D2	**Land treatment**	**Land treatment, (e.g. biodegradation of liquid or sludgy discards in soils, etc.)** Spreading of waste on land, often followed by the incorporation of the waste into the soil, which does not result in benefit to agriculture or other ecological improvements. Generally, applies to non-hazardous sludge and liquid wastes, e.g. disposal of dredging sludge.
D3	**Deep injection**	**Deep injection, (e.g. injection of pumpable discards into wells, salt domes or naturally occurring repositories, etc.)** Means the injection of waste into natural and artificial cavities (e.g. salt domes, wells, mines), or into porous formations of rock.
D4	**Surface impoundment**	**Surface impoundment, (e.g. placement of liquid or sludge discards into pits, ponds or lagoons, etc.)** Means the deposit of waste in natural or engineered ponds, pits or lagoons (impoundment), which is the predominant method for the management of tailings in mining operations (e.g. in the metal mining sector).

D Codes		Description and Examples of Disposal Codes
D5	**Engineered landfill**	**Specially engineered landfill, (e.g. placement into lined discrete cells which are capped and isolated from one another and the environment, etc.)** **D5 has the following three options:** • Specially engineered landfill, non-hazardous waste. • Specially engineered landfill, hazardous waste. • Specially engineered landfill, inert waste.
D6	**Release to waters**	**Release into a water body except seas/oceans** Deposit of non-hazardous dredging sludge and other non-hazardous sludge in surface water including the bed and the subsoil.
D7	**Release to sea**	**Release to seas/oceans including sea-bed insertion** Discharge of waste at sea in accordance with the OSPAR Convention (e.g. inert materials of natural origin).
D8*	**Biological treatment**	**Biological 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 D1 to D12** Comprises operations which use aerobic or anaerobic biological processes in order to prepare the waste for subsequent disposal, e.g. by reducing the amount of biodegradable components or by degradation of organic pollutants. This includes biological-mechanical treatment of municipal waste; biological treatment of contaminated soil, sludges or mineral wastes, if followed by disposal.
D9*	**Physico chemical treatment**	**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 D1 to D12 (e.g. evaporation, drying, calcination etc.)** Covers the pre-treatment of mainly fluid and pasty type hazardous waste by a variety of chemical, thermal and physical processes in order to achieve an output which can be disposed of. Physico-chemical treatment is typically deployed for emulsions and oil/water mixtures, neutral aqueous organics and inorganics (production specific waste water, leachate, etc.), cyanides, acids and alkalis. Typical treatment steps are detoxification (oxidation/reduction), precipitation, neutralisation, emulsion separation, immobilisation, electrolysis and osmosis.

	D Codes	Description and Examples of Disposal Codes
D10	**Incineration on land**	Covers the incineration of waste where the main purpose of the incineration is the thermal treatment of waste in order to reduce the volume and the hazardousness of the waste, and to obtain an inert product that can be disposed of. The most common examples are municipal solid waste incineration plants (unless they fulfil the energy efficiency standards under Annex II of the Waste Framework Directive), hazardous waste incineration plants, sewage sludge incineration plants, incineration plants for clinical waste or animal carcasses. D10 also covers the incineration of waste in co-incineration plants where the waste undergoes thermal treatment rather than being used as a fuel. **D10 has the following two options:** • Incineration on land (disposal) - non-hazardous waste. • Incineration on land (disposal) - hazardous waste.
(D11)	**(Incineration at sea)**	**(Incineration at sea)** *This operation is prohibited by EU legislation and international conventions.*
D12	**Permanent storage**	**Permanent storage (e.g. emplacement of containers in a mine, etc.)** Landfills for the underground storage of waste.
D13*	**Blending or mixing prior to submission to any of the operations numbered D1 to D12**	**Blending or mixing prior to submission to any of the operations numbered D1 to D12** Covers preparatory activities whose purpose is the conditioning and packaging of waste for subsequent transport and further treatment prior to disposal. Includes basic sorting activities; crushing and shredding of waste in order to reduce the volume of waste for transport or landfilling; mixing and blending of waste (e.g. mixing of similar wastes from different waste generators); homogenisation, conditioning and solidification.
D14*	**Repackaging prior to submission to any of the operations numbered D1 to D13**	**Repackaging prior to submission to any of the operations numbered D1 to D13** Covers preparatory activities whose purpose is the conditioning and packaging of waste for subsequent transport and further treatment prior to disposal. Includes transfer and compaction of waste; packaging of asbestos.
D15*	**Storage pending any of the operations numbered D1 to D14 (excluding temporary storage, pending collection, on the site where the waste is produced)**	**Storage pending any of the operations numbered D1 to D14** Does not apply to storage of waste prior to collection at the site at which it was generated. Temporary storage of waste prior to disposal is limited to a period of <1 year. Otherwise the provisions of the Landfill Directive apply (Directive 1999/31/EC, Article 2(g)).

* These codes (i.e. D8, D9, D13, D14, D15) refer to pre-treatment operations, which must be followed by one of the other disposal operations.

R Codes		Description and Examples of Recovery Codes
R1	**Use as fuel**	**Use principally as a fuel or other means to generate energy** Covers the incineration and co-incineration of waste in power stations and industrial facilities such as cement kilns so that the resultant energy can be used to generate heat or electricity. Common examples are:- use of tyres, waste oils, or spent solvents in cement kilns; co-incineration of sewage sludge or refuse-derived fuel (RDF) from municipal waste in power stations. **R1 has the following four options:** • Incineration plant (use as fuel) - non-hazardous waste. • Incineration plant (use as fuel) - hazardous waste. • Co-incineration plant (use as fuel) - non-hazardous waste. • Co-incineration plant (use as fuel) - hazardous waste.
R2	**Solvent reclamation/regeneration**	**Solvent reclamation/regeneration** Covers all treatment activities, whose purpose is the regeneration or recovery of spent solvents, e.g.re-refining of solvents in order to separate contaminants and to restore the solvent to its original quality or to a lower grade product (e.g. lacquer thinner); preparation of secondary liquid fuels, usually by blending with other liquid wastes.
R3	**Organic substance recycling/reclamation**	**Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes)** Operations whose purpose is the recovery of biodegradable and non-biodegradable organic materials. These operations include the following: preparing for reuse, recycling of waste paper and board; reprocessing and recycling of plastic waste; composting of bio waste and green waste; fermentation of biodegradable waste for biogas production (biogas plants). **R3 has the following six options:** • Composting (aerobic). • Anaerobic digestion. • Gasification or pyrolysis (other than incineration or co-incineration plant). • Preparing for reuse of organic substances. • Recovery of organic materials in the form of backfilling. • Other recycling or reclamation of organic substances which are not used as solvents (to end-of-waste).

	R Codes	Description and Examples of Disposal Codes
R4	**Metal recycling/reclamation**	**Recycling/reclamation of metals and metal compounds** Covers all treatment operations whose purpose is the recycling of metal waste, and of complex products with metals as the predominant material. The treatment operations include a variety of mechanical, thermal and chemical treatment steps and processes, such as the following: preparing for reuse, recycling of scrap and production waste in steelworks; shredding and reprocessing of ELVs and WEEE; thermal treatment of cables or oil-contaminated metals; battery recycling; electrolytic recovery of silver from photo chemicals. **R4 has the following two options:** • Preparing for reuse of metal and metal compounds. • Metal and metal component recycling or reclamation (to end-of-waste).
R5	**Inorganic substance recycling/reclamation**	**Recycling/reclamation of other inorganic materials** Operations whose purpose is the recovery of inorganic non-metal wastes and which are not covered by other more specific operations (e.g. R6, R8, R10). Inorganic non-metal wastes represent a large proportion of the total waste generated and consist of a broad spectrum of waste types. The main groups are waste from thermal processes (slag, ashes, sands, dust etc.), construction & demolition waste, and waste from mining and quarrying. The treatment processes include the following: preparing for reuse, reprocessing of construction and demolition waste; reprocessing and recycling of glass waste; use as secondary raw material in cement kilns; asphalt mixing plants. This includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials. **R5 has the following three options:** • Inorganic materials recycling or reclamation (to end-of-waste) (e.g. soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials). • Preparing for reuse of inorganic materials. • Recovery of inorganic materials in the form of backfilling.
R6	**Regeneration of acids or bases**	**Regeneration of acids or bases** Comprises operations whose purpose is the regeneration and subsequent reuse of spent acids/bases for the original purpose or for other purposes. For example, re-concentration of spent acids; the thermal decomposition of spent sulphuric acid for use as feedstock in sulphuric acid production.

	R Codes	Description and Examples of Disposal Codes
R7	**Recovery of components used for pollution abatement**	**Recovery of components used for pollution abatement** Treatment operations whose purpose is the regeneration of pollution abatement materials such as activated carbon and ion exchange resins, for example regeneration of activated carbon from water purification and flue gas treatment, mainly by thermal treatment; the regeneration of ion exchange resins by solvent washing.
R8	**Recovery of components from catalysts**	**Recovery of components from catalysts** Covers treatment operations whose purpose is regeneration of catalysts to be reused as catalysts; the recovery of catalyst components, mainly of metal components, e.g. recycling of precious metals from catalytic converters in vehicle exhausts.
R9	**Oil re-refining or other reuses of oil**	**Oil re-refining or other reuses of oil** Covers all processes whose purpose is the reuse of waste oil. The two main options are the re-refining of waste oil and the preparation of fuels from waste oils. - Re-refining reconverts waste oils into base oils which can be used to manufacture lubricating products; use to generate fuel which can be used as a substitute for coal, diesel and light fuel.
R10	**Land treatment resulting in benefit to agriculture or ecological improvement**	**Land treatment resulting in benefit to agriculture or ecological improvement** Covers the use of organic and mineral wastes as fertilisers or soil conditioners in agriculture; other applications of waste on land on which no food and feed crops are cultivated, and which result in ecological improvement such as landscape restoration and restoration of old disused quarries. The following are examples of R10: sewage sludge in agriculture in compliance with the Sewage Sludge Directive; the spreading on land of compost from the treatment of separately collected biowaste; the use of manure in compliance with agricultural regulations; the use of mineral wastes as fertilisers in compliance with national legislation.
R11	**Use of waste obtained from any of the operations numbered R1 to R10**	**Uses of waste obtained from any of the operations numbered R1 to R10** Comprises the recovery of residual waste from previous recovery operations. It is a redundant entry as it covers only treatment operations that could be assigned to one of the more specific codes R2 to R10.

	R Codes	Description and Examples of Disposal Codes
R12*	**Exchange of waste for submission to any of the operations numbered R1 to R11**	**Exchange of waste for submission to any of the operations numbered R1 to R11** Covers preparatory treatment activities prior to recovery such as basic sorting activities; mixing of waste from different generators before it is sent to a recovery facility; transfer and compaction of waste; shredding of wood waste prior to energy recovery. **R12 has the following four options:** • Biostabilisation of organic fines. • Production of fuel from waste incl SRF and RDF. • Depollution or dismantling of waste vehicles incl end-of-life vehicles. • Exchange of waste for submission to any of the operations numbered R1 to R11 (see R12 description in guidance for full list).

R13*	**Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where the waste is produced)**	**Accumulation of material intended for any operation numbered R1 to R12** Temporary storage means preliminary storage according to point (10) of Article 3 of the Waste Framework Directive 2008.

* These codes (R12, R13) refer to pre-treatment operations, which must be followed by one of the other recovery operations.

Backfilling

Backfilling[1] means any recovery operation where suitable non-hazardous waste is used for purposes of reclamation in excavated areas or for engineering purposes in landscaping. Waste used for backfilling must substitute non-waste materials, be suitable for the aforementioned purposes, and be limited to the amount strictly necessary to achieve those purposes. Backfilling does not have a clear assignment to the recovery (R) codes. Depending on the wastes used for backfilling it may be assigned to R3 and R5. Note however that backfilling is *not* a recycling operation.

[1] Waste Framework Directive, Article 3, 2008/98/EC (as amended) of the European Parliament.