

A faint, light blue architectural line drawing of a modern building with a complex, wavy facade and a grid-like structure, serving as a background for the title section.

## ANNEX 16.3: Waste Management Plan

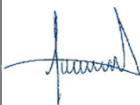


Environmental Impact Assessment (EIA) of the Project:  
CO<sub>2</sub> Storage Unit in Prinos

Date: 02/08/2024

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# 1 INTRODUCTION

## 1.1 SCOPE AND OBJECTIVES OF THE WASTE MANAGEMENT PLAN

The scope of the Waste Management Plan (WMP) includes the initial assessment of the types and quantities of waste expected to be generated during the implementation of the Project “CO<sub>2</sub> Storage Unit in Prinos,”<sup>1</sup> the specification of objectives and requirements, and the development of proposals and actions for the management and disposal of the respective waste in accordance with applicable legislation, prioritizing prevention, reuse, recycling, and source separation.

The WMP aims to satisfy the requirements and objectives set by national and European legislation, the National Waste Management Plan (NWMP), the National Hazardous Waste Management Plan (NHWMP), the National Waste Prevention Programme 2021–2030 (NWPP), the Revised Regional Solid Waste Management Plan (RSWMP) of the Region of Eastern Macedonia and Thrace (2016), and the Local Waste Management Plan (LWMP) of the Municipality of Kavala (2021).

It is noted that the WMP serves as a guiding document. Its purpose is to be used as a dynamic reference framework, outlining directions for the integrated management of waste, the specific actions to be implemented, and highlighting the constraints and objectives to be met.

The WMP includes the following:

- the formulation of the fundamental principles and assumptions of the design – incorporation of obligations and requirements of applicable legislation on Waste Management (WM),
- the estimation of the type (according to the European Waste Catalogue – EWC) and quantity of waste generated during the implementation phase of the Project, and the proposed integrated waste management system,
- the monitoring of the plan's implementation.

## 1.2 PROJECT SUMMARY DESCRIPTION

The project under study consists of a full-scale CO<sub>2</sub> storage installation in Prinos (the “Project”) <sup>1</sup>. The planned CO<sub>2</sub> storage site is located within the Prinos Basin, in the Gulf of Kavala, in the Northern Aegean. The area of interest for CO<sub>2</sub> storage lies within the Prinos Concession, where Energean Oil & Gas SA (“Energean”), an affiliated company of EnEarth, has held 100% of the interests and operatorship for oil and gas exploration and production activities since 2007. The potential CO<sub>2</sub> storage location is situated within the Prinos structure and the underlying aquifer.

The operation of the facility is planned to be developed in two distinct phases (Phase 1 and Phase 2), to allow for scalability and adaptation to market conditions.

The project under study concerns the installation of a full-scale carbon dioxide (CO<sub>2</sub>) storage unit in Prinos (the “Project”). The planned CO<sub>2</sub> storage site is located within the Prinos Basin, in the Gulf of Kavala, in the Northern

<sup>1</sup> Hereinafter referred to as the “Project”



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The operation of the facility is planned to be developed in two distinct phases based on capacity (Phase 1 and Phase 2), to allow for scalability and adaptation to market conditions.

This study concerns **Phase 1 of the Project**.

Phase 1 has an initial nominal capacity of up to 1 MTPA for 20 years (commencement around late 2025 to early 2026). The CO<sub>2</sub> will be mainly supplied in bulk via a third-party pipeline that will reach a designated area within the existing Sigma onshore industrial facility under appropriate conditions for injection. The CO<sub>2</sub> stream from the onshore station within the Sigma facility will be transported through a new subsea pipeline, approximately 20 km in length, to the existing Beta platform of the offshore facilities, where the injection of CO<sub>2</sub> into the reservoir will take place through dedicated injection wells.

In addition, small quantities of CO<sub>2</sub> will be received at the Sigma onshore facilities in ISO containers, transported by trucks, within the framework of pilot CO<sub>2</sub> capture projects. The containers will either be loaded onto ships by cranes and transferred to the existing Beta platform of the Prinos offshore facilities via a flexible hose system, where appropriate conditions for injection will be achieved, or be directly injected into the manifold together with the bulk CO<sub>2</sub> stream.

The new facilities and wells foreseen for the operation of Phase 1 of the Project and forming the subject of this study include:

- Onshore facilities: modification of a designated area within the existing Sigma plant site for the construction of the CO<sub>2</sub> reception manifold and an unloading and compression area.
- Offshore pipeline: subsea pipeline connecting the Sigma plant area with the offshore Beta platform, approximately 20 km in length.
- Offshore platforms: modification and/or use of the existing Prinos offshore facilities (Beta and Delta platforms) for receiving CO<sub>2</sub> from the new subsea pipeline and ISO container shipments, injecting it into the new wells, and treating the produced water (Delta platform).
- Wells: 2 CO<sub>2</sub> injection wells and 2 water production wells on the existing Beta platform of the Prinos offshore complex.

Modifications will be made to the existing Beta platform to include the necessary CO<sub>2</sub> injection facilities. The platform has 12 well slots and is connected to the Delta processing platform. As part of the Project, 4 of the 12 slots will be used for the two new CO<sub>2</sub> injection wells and the two new water production wells (Table 1-1). Electric Submersible Pumps (ESP) will operate in the two water wells to extract water from the reservoir, providing a means of active pressure management. Water will be managed at the existing processing facility on the Delta platform.

Πίνακας 1-1: Κρηπρία Τελικού Βάθους Γεώτρησης (UTM zone 35N)

Drilling Type	Name	Kick-off Well	Kick-off Depth of New Well (m)	Target	Surface Location
CO <sub>2</sub> Injection	PBC-1	PB-17A	1.000	X:287725.69 y:4518803.72 Z:-2779.95	X:288963.21 y:4519413.86
CO <sub>2</sub> Injection	PBC-2	PB-24	1.000	X:287778.73 y:4519015.54 Z:-2718.38	X:288963.21 y:4519411.57
Water Production	PBW-1	PB-22	1.000	X:290192.01 y:4517931.73 Z:-2741.54	X:288967.79 y:4519416.15
Water Production	PBW-2	PB-23A	1.000	X:290060 y:4518995 Z:-2840	X:288965.50 y:4519413.86

The modification of the Delta platform will involve an overall upgrade of the auxiliary facilities, the produced water treatment and disposal unit, as well as the control and safety systems. The aim is for the water produced from the two new wells—used for managing the reservoir pressure—to be treated using the existing facilities. This integrated approach optimizes resource utilization while enhancing the platform’s operational performance and environmental management.

During the construction phase of the Project, the following activities will be carried out:

- Structural works and modifications, installation of CO<sub>2</sub> reception and handling equipment at the Sigma onshore facilities.
- Installation of buried CO<sub>2</sub> transfer pipelines (onshore pipeline and offshore pipeline).
- Construction of CO<sub>2</sub> injection wells and water production wells:
  - Delivery & installation of drilling rig.
  - Preparation of existing starter well (installation of permanent mechanical barrier and preparation for sidetrack drilling).
  - Drilling of 16” diameter well to a depth of up to ~2,200 m.
  - Drilling of 12-1/4” x 13½” diameter well to a depth of up to approximately 3,150 m.
  - Drilling of 8-1/2” diameter well to a depth of up to approximately 3,700 m.

The drilling muds to be used are provided in the following table:

Πίνακας 1-2: Πολφού γεώτρησης

Section	Diameter (inches)	Estimated drilling mud volume per well (m <sup>3</sup> )	Drilling mud system – Main additives	Mud type
I	16”	+/- 700	Gel / Polymer / Lime Additives: Bentonite, Potassium Chloride, Polypac, CMC, Lime, Calcium Carbonate, Sodium Chloride, Flo-Vis.	Water-based / Lime
II	12 1/4”	+/- 490	Versavert LTOBM Additives: EDC 95/11, Safe-Scav, Safe Carb, Bentonite, Calcium Chloride, Barite, Versatrol	Oil-based
III	8 1/2”	+/- 350	FLO-PRO WBM or Versavert LTOBM Additives: Flo-Trol, Soda Ash, Safe-Scav, Sodium Chloride, Zinc Oxide, Conqor	Oil-based / Water-based

The decommissioning of the Project, with priority given to the plugging of wells and the safety of the reservoir, will be carried out in accordance with best practices and guidelines (Offshore Energies United Kingdom (OEUK), 2022).

## 2 WASTE MANAGEMENT STRATEGY

### 2.1 BASIC PRINCIPLES OF WASTE MANAGEMENT

The basic principles on which the Project's Waste Management Plan is based are the following:

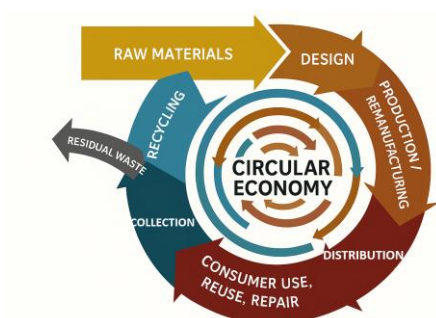
#### Waste hierarchy<sup>2</sup>:

Prevention and reuse of waste are the most preferred options, followed by recycling (including composting) and then energy recovery. The disposal of waste in sanitary landfills is considered the last resort.



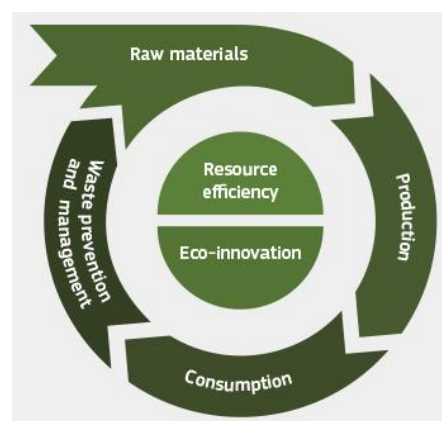
#### Circular economy:

This model involves the efficient use of resources and favors the input of renewable energy sources, the maximization of the use and lifespan of a product in order to extract the maximum value, as well as the recovery and reuse of by-products and waste to manufacture new materials or products. It promotes the practices of maintenance, reuse/redistribution, refurbishment/remanufacturing, and recycling to create a closed-loop system, minimizing resource inputs and the generation of waste, pollution, and carbon emissions.

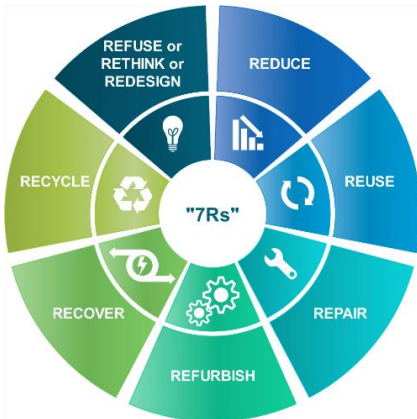


#### Green development and circular economy:

The management of the life cycle of natural resources—from extraction to the design and manufacture of products, and finally to what is considered as waste—is essential for green development and is part of building a resource-efficient circular economy where nothing goes to waste. Smarter design allows products to be repaired, reused, remanufactured, and eventually recycled again.



<sup>2</sup> Directive 2008/98/EC on waste, as amended and in force. When applying the waste hierarchy, measures must be taken to promote alternative options that deliver the best overall environmental outcome. This may require deviating from the hierarchy for certain specific waste streams, provided this is justified on the basis of life-cycle thinking, taking into account the overall impacts of the generation and management of such waste.



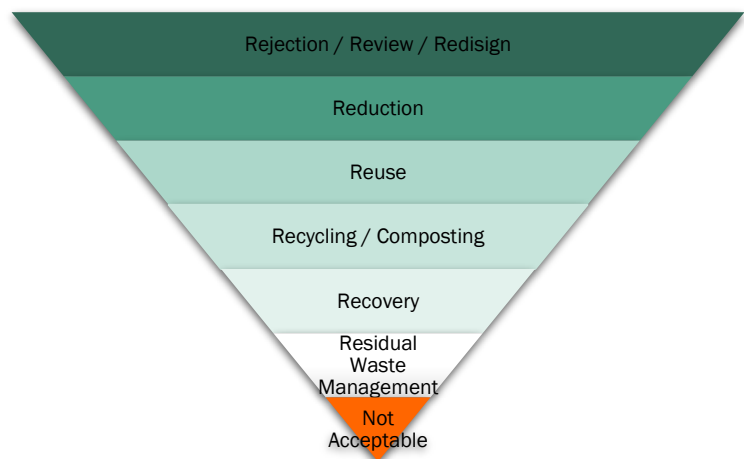
In this context, as outlined above, the traditional 3Rs (Reduce, Reuse, Recycle – Waste Hierarchy) approach is redefined, with an increase in the number of actions to achieve more effective Waste Management.

The circular economy is structured around the philosophy based on the “7Rs”:

***Refuse or Rethink or Redesign – Reduce – Reuse – Repair – Refurbish – Recover – Recycle.***

In the same spirit, the philosophy of “Zero Waste” pertains to waste management and the design of approaches that emphasize preventing waste generation rather than managing it after it has been produced. It is a systemic approach aimed at radically transforming the flow of materials throughout society, with the ultimate goal of achieving zero waste.

The philosophy of “Zero Waste” includes not only eliminating waste through recycling and reuse and ending the incineration or landfilling of waste (unacceptable practices), but also focusing on the restructuring of production and distribution systems to reduce waste.



#### “Polluter pays” principle:

The cost of waste management, including the cost of the necessary infrastructure and its operation, is borne by the original producer of the waste or the current or previous holders of the waste.

#### Proximity principle:

Possibility for the disposal or recovery of waste at one of the closest suitable facilities, using the most appropriate methods and technologies, in order to ensure a high level of protection for the environment and public health.

#### Sustainable systems:

Development of systems that are adaptable, flexible, scalable, resilient, and appropriate within the limits of the local ecosystem.

The Waste Management Plan (WMP) takes into account the general principles of environmental protection, precaution and sustainability, technical feasibility and economic viability, resource protection, as well as the overall impact on the environment, human health, the economy, and society.

## 2.2 INSTITUTIONAL FRAMEWORK FOR WASTE MANAGEMENT

The main institutional framework governing waste management in Greece is defined by:

- **Law 4819/2021** (Government Gazette 129/A/23.07.2021): “Integrated framework for waste management – Transposition of Directives 2018/851 and 2018/852 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste and Directive 94/62/EC on packaging and packaging waste, framework for the organization of the Hellenic Recycling Organization, provisions for plastic products and the protection of the natural environment, spatial planning - urban planning, energy and related urgent regulations,” as amended and in force.
- **Law 4685/2020** (Government Gazette 92/A/7.5.2020): “Modernization of environmental legislation, transposition into Greek law of Directives 2018/844 and 2019/692 of the European Parliament and of the Council, and other provisions,” as amended and in force.
- **Law 4042/2012** (Government Gazette 24/A/13.2.2012): “Criminal protection of the environment – Harmonization with Directive 2008/99/EC – Framework for the production and management of waste – Harmonization with Directive 2008/98/EC – Regulation of issues of the Ministry of Environment, Energy and Climate Change,” which incorporates into national law the Waste Framework Directive 2008/98/EC, as amended and in force.
- **Law 1650/1986** (Government Gazette 160/A/16.10.1986): “On environmental protection,” as amended and in force.

In addition, a series of ministerial decisions and presidential decrees have been issued to regulate specific matters, as recorded below:

**Table 1-3: Legislative Framework Regulating Specific Waste Management Issues**

Legislation	Description
<b>JMD 114218/1997 (GG 1016/B/17.11.1997)</b>	Establishment of a framework of Specifications and general solid waste management programs
<b>JMD 7589/731/2000 (GG B 514/11.4.2000)</b>	Definition of measures and terms for the management of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT)
<b>MD 18083/1098/E.103/2003 (GG B 606/15.5.2003)</b>	Disposal/disinfection plans for devices containing PCBs – General guidelines for the collection and subsequent disposal of devices and PCB-containing waste, in accordance with Article 7 of Joint Ministerial Decision 7589/731/2000 (B' 514)
<b>PD 82/2004 (GG A 64/2.3.2004)</b>	Replacement of JMD 98012/2001 “Determination of measures and conditions for the management of used mineral oils” (B' 40). Measures, conditions and program for the alternative management of Waste Lubricating Oils. Note: Abolished after the issuance of the Joint Decisions of the Minister for the Environment and Energy and the respective competent ministers on End-of-Life Vehicles (ELVs), waste oils and used vehicle tires, pursuant to Article 101§4: Article 73§b, Law 4819/2021



Legislation	Description
PD 109/2004 (GG 75/A/5.3.2004)	Measures and conditions for the alternative management of used vehicle tires. Program for their alternative management. <i>Note: Abolished after the issuance of the Joint Decisions of the Minister for the Environment and Energy and the respective competent ministers, pursuant to Article 101§4: Article 73§c, Law 4819/2021</i>
PD 117/2004 (GG A 82/5.3.2004)	Measures, conditions and program for the alternative management of waste from electrical and electronic equipment, in accordance with Directives 2002/95 "on the restriction of the use of certain hazardous substances in electrical and electronic equipment" and 2002/96 "on waste electrical and electronic equipment" of the Council of 27 January 2003, as amended and in force
PD 116/2004 (GG 81/A/5.3.2004)	Measures, conditions and program for the alternative management of end-of-life vehicles, their used spare parts and deactivated catalytic converters, in accordance with Directive 2000/53/EC "on end-of-life vehicles" of the Council of 18 September 2000, as amended by MD 42666/1345/E103/2013 (GG 1879/B/01.08.13) <i>Note: Abolished after the issuance of the Joint Decisions of the Minister for the Environment and Energy and the respective competent ministers, pursuant to Article 101§4: Article 73§a, Law 4819/2021</i>
PD 15/2006 (GG A 12/3.2.2006)	Amendment of Presidential Decree 117/2004 (A' 82), in accordance with Directive 2003/108 "amending Directive 2002/96 on waste electrical and electronic equipment (WEEE)" of the Council of 8 December 2003
JMD 13588/725/2006 (GG 383/B/28.3.2006)	Measures, conditions and restrictions for the management of hazardous waste in accordance with Directive 91/689/EEC "on hazardous waste" of the Council of 12 December 1991, as amended and in force
MD 39624/2209/E103/2009 (GG 2076/B/25.9.2009)	Measures, terms, and restrictions for the management of extractive waste, in accordance with Directive 2006/21/EC of 15 March 2006 "on the management of waste from extractive industries and amending Directive 2004/35/EC"
Law 3854/2010 (GG 94/A/23.06.2010)	Amendment of the legislation on the alternative management of packaging and other products and the National Organization for the Alternative Management of Packaging and Other Products (EOEDSAP), as amended and in force
JMD 36259/1757/E103/2010 (GG 1312/B/24.08.2010)	Measures, terms, and program for the alternative management of excavation, construction, and demolition waste (CDW), as amended and in force
JMD 41624/2057/E103 (GG B 1625/11.10.2010)	Measures, conditions and programme for the alternative management of waste batteries and accumulators, in compliance with the provisions of Directives 2006/66/EC "on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC" and 2008/103/EC "amending Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators as regards the placing on the market of batteries and accumulators", of the European Parliament and of the Council, as amended and in force
JMD oik. 146163/2012 (GG B 1537/08.05.2012)	Measures and conditions for the management of Healthcare Waste
JMD 36060/1155/E.103/2013 (GG B 1450/14.06.2013)	Establishment of a framework of rules, measures and procedures for the integrated prevention and control of environmental pollution from industrial activities, in compliance with Directive 2010/75/EU "on industrial emissions (integrated pollution prevention and control)" of the European Parliament and of the Council of 24 November 2010, as amended and in force
MD 54461/1779/E.103/2013 (GG B 2500/04.10.2013)	Replacement of Annex I of Article 4 of JMD 9268/469/2007 (GG B 286), in compliance with Directive 2013/2/EU "amending Annex I to Directive 94/62/EC of the European Parliament and of the Council on packaging and packaging waste" of the European Commission of 7 February 2013
MD H.P. 23615/651/E.103/2014 (GG B 1184/09.05.2014)	Establishment of rules, conditions and requirements for the alternative management of Waste Electrical and Electronic Equipment (WEEE), in compliance with the provisions of Directive 2012/19/EU "on waste electrical and electronic equipment (WEEE)", of the European Parliament and of the Council of 4 July 2012, and other provisions, as amended and in force

Legislation	Description
JMD oik. 56366/4351/2014 (GG B 3339/12.12.2014)	Specification of requirements (standards) for treatment operations within the framework of mechanical-biological treatment of mixed municipal waste and definition of the characteristics of the materials produced depending on their uses, pursuant to point (b) of paragraph 1 of Article 38 of Law 4042/2012 (GG A 24)
MD Oik. 41848/1848/2017 (GG B 3649/16.10.2017)	Amendment of JMD oik. 146163/2012 – Measures and Conditions for the Management of Healthcare Waste, as in force
Law 4496/2017 (GG A 170/08.11.2017)	Amendment of Law 2939/2001 on the alternative management of packaging and other products, adaptation to Directive 2015/720/EU, regulation of issues of the Hellenic Recycling Organization and other provisions
Law 4736/2020 (GG A 200/20.10.2020)	Transposition of Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment and other provisions, as amended and in force
Circular YPEN/DDA/8437/176/28.1.2021	Collection and transport of non-hazardous waste in application of paragraph 4 of Article 36 of Law 4042/2012, as replaced by paragraph 1 of Article 85 of Law 4685/2020 (CORRECTED REPUBLICATION 09.02.2021)
MD YPEN/DDA/81490/1650/2021 (GG B 4382/22.09.2021)	Transposition of Directive (EU) 2018/849 of the European Parliament and of the Council of 30 May 2018 amending Directives 2000/53/EC on end-of-life vehicles, 2006/66/EC on batteries and accumulators and waste batteries and accumulators, and 2012/19/EU on waste electrical and electronic equipment (WEEE), to the extent that it concerns the amendment of Directive 2012/19/EU on WEEE – Amendment of Joint Ministerial Decision H.P. 23615/651/E.103/2014 (GG B 1184) of the Ministers of Development and Competitiveness and of Environment, Energy and Climate Change “Establishment of rules, terms and conditions for the alternative management of waste electrical and electronic equipment (WEEE), in compliance with the provisions of Directive 2012/19/EU of the European Parliament and the Council of 4 July 2012 and other provisions.” (GG B 1184)
MD YPEN/DDA/81492/1651/2021 (GG B 4382/22.09.2021)	Transposition of Directive (EU) 2018/849 of the European Parliament and of the Council of 30 May 2018 amending Directives 2000/53/EC on end-of-life vehicles, 2006/66/EC on batteries and accumulators and waste batteries and accumulators, and 2012/19/EU on waste electrical and electronic equipment (WEEE), to the extent that it concerns the amendment of Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators – Amendment of JMD 41624/2057/2010 of the Ministers of Economy, Competitiveness and Shipping, and of Environment, Energy and Climate Change “Measures, conditions and programme for the alternative management of waste batteries and accumulators in compliance with the provisions of Directives 2006/66/EC ‘on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC’ and 2008/103/EC ‘amending Directive 2006/66/EC as regards the placing on the market of batteries and accumulators’ of the European Parliament and of the Council” (GG B 1625)
MD YPEN/DDA/90439/1846/2021 (GG B 4514/30.09.2021)	Measures and conditions for the landfilling of waste in alignment with the provisions of Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste, as amended by Directive (EU) 2018/850 of the European Parliament and of the Council of 30 May 2018
MD YPEN/DDA/41531/626/2023 (GG B 2654/21.04.2023)	Replacement of Annex II of Article 18 of Presidential Decree 116/2004 “Measures, conditions and programme for the alternative management of end-of-life vehicles, their used parts and deactivated catalytic converters in compliance with the provisions of Directive 2000/53/EC on end-of-life vehicles of the Council of 18 September 2000” (GG A 81), in compliance with the provisions of Commission Delegated Directive (EU) 2023/544 of 16 December 2022 amending Directive 2000/53/EC of the European Parliament and of the Council as regards exemptions for the use of lead in aluminium alloys for machining purposes, in copper alloys and in certain batteries



Other key European Union directives on waste have also been transposed into national law, while the **European Waste Catalogue (EWC)** has direct applicability, in accordance with the Annex to Decision 2000/532/EC (L 226), as amended and in force.

In addition, the **National Waste Prevention Program 2021–2030 (NWPP)** has been adopted, which defines the strategy, policies and objectives for waste prevention at the national level, and its drafting constitutes an obligation of Greece arising from **Directive 2008/98/EC**, as amended by **Directive (EU) 2018/851**.

The **National Waste Management Plan 2020–2030 (NWMP)** is in force, as adopted by Ministerial Act No. 39 of 31.8.2020 (Government Gazette 185/A/29.9.2020), and amended by Cabinet Act No. 5 of 18.4.2023 (Government Gazette 94/A/18.4.2023). The **National Hazardous Waste Management Plan (NHWMP)** is also in force, as adopted by Ministerial Decision No. oik. 62952/5384/2016 (Government Gazette 4326/B/30.12.2016). In addition, the Updated **Regional Waste Management Plan (RWMP) of the Region of Eastern Macedonia and Thrace**, adopted by Joint Ministerial Decision No. 61076/5267 (Government Gazette B'/4123/21-12-2016), and the **Local Waste Management Plan (LWMP) of the Municipality of Kavala (2021)** are also in force.

The NWMP defines the policy, strategies, pillars, and both qualitative and quantitative objectives for waste management and its individual streams, excluding the wastes referred to in Article 2 of Law 4819/2021, which include wastes from the exploration and extraction of mineral resources (paragraph 2d). It also sets out the action pillars and measures for achieving the targets defined by both national and EU legislation on waste management. The NWMP has set ambitious targets aligned with EU directives regarding source separation, which are also targets of the Circular Economy package. These include achieving at least 55% by weight of preparation for reuse and recycling of Municipal Solid Waste (MSW) by 2025 and 60% by 2030. It also sets a target to minimize landfilling to 10% of generated MSW by 2030.

In order to achieve the above objectives, the NWMP provides for the implementation of specific measures as well as the competent authorities for their implementation, aiming in particular at the development of separate collection, which among others includes:

- the separate collection of new waste streams.
- source separation.
- the "Pay-As-You-Throw" principle.
- the strengthening and upgrading of Sorting Centers for Recyclable Materials (SCRMs).

The **NWMP** aims, through the integrated and rational management of hazardous waste, to promote the waste hierarchy as provided for in Directive 2008/98/EC, in order to reduce the impacts on the environment and public health, while at the same time ensuring that waste management contributes positively to economic and social development. Within the framework of the NWMP, hazardous waste is grouped into the following streams:

- Industrial hazardous waste (IHW).
- Hazardous waste from healthcare units (HWHU).
- Hazardous waste from public utility facilities, public service units, etc. (PUF).
- Hazardous waste falling under alternative management:
  - Waste oils (WO).
  - Waste batteries and accumulators from vehicles and industry (WBAVI).
  - Waste portable batteries and accumulators (WPBA).
  - Waste falling under alternative management and classified as hazardous or generating hazardous waste during decontamination: Hazardous end-of-life vehicle decontamination waste (ELV), Waste lamps containing hazardous substances, Hazardous waste from decontamination of waste electrical and electronic equipment (WEEE).
- Waste containing asbestos (hazardous C&DW).
- Small quantities of hazardous waste in Municipal Solid Waste (SQHW).
- Packaging waste containing hazardous substances.
- Waste containing polychlorinated biphenyls/triphenyls (PCB/PCT).

The general objectives of the **RSWMP** of the Region of Eastern Macedonia and Thrace are:

- Sustainable waste management throughout the Region.
- Prevention – reduction of the generation of municipal waste, prioritizing the prevention and continuous reduction of packaging waste, food (bio-waste), paper and WEEE, with particular emphasis on public awareness and guidance of target groups and the implementation of specialized actions.
- Expansion and modernization of the municipal waste collection and transportation network.
- Enhancement of actions promoting the reuse of unwanted products that do not need to be discarded as waste.
- Strengthening recycling by encouraging alternative management systems for packaging and other products.
- Utilization of various materials contained in municipal waste (recycling) and energy recovery from them, in order to conserve resources and energy and reduce the final disposal rate.
- Safe final disposal: environmentally acceptable final disposal in sanitary landfills (SLs) of the portion of municipal waste that cannot undergo further treatment.

- Restoration of environmental damage: cessation of operation, gradual restoration and environmental upgrading of sites that have been polluted by uncontrolled municipal waste disposal.
- Implementation of the proximity principle.
- Public information and awareness so that there is active participation and responsibility of citizens in solid waste management.
- Full harmonization with Joint Ministerial Decision 29407/3508/2002, which requires significant upgrading and transformation of management bodies, changes in the project planning and permitting process, immediate introduction of waste treatment technologies, changes in the pricing of provided services, and sets stricter operating rules for SLs with the ultimate aim of constructing as few SLs as possible, operating them to higher standards, and gradually converting them into sanitary landfills for residual waste (SLRWs).

The main national targets for Municipal Solid Waste (MSW) management set out in the Local Waste Management Plan (LWMP) of the Municipality of Kavala (2021) are summarized below:

- Practical implementation of the waste management hierarchy, whereby landfilling – always and only after appropriate pre-treatment of waste – is the last resort. The maximum percentage of municipal waste that will be landfilled by 2030 must not exceed 10%.
- Mandatory universal separate collection of bio-waste by 31 December 2022.
- Packaging waste recycling must reach 65% by weight by 2025 and 70% by weight by 2030, with specific targets set for individual packaging waste streams.
- Increase in the preparation for reuse and recycling of MSW to at least 55% by weight by 2025 and 60% by weight by 2030.
- Energy recovery of residual MSW and secondary (refuse-derived) fuels.
- Safe final disposal in Sanitary Landfills for Waste/Residuals (SL/SLRWs) for the entire country.
- Final closure and remediation of all existing uncontrolled waste disposal sites (UWDSs) by 2022.

## 2.3 LEGISLATIVE PROVISIONS AND RESTRICTIONS

The Project's WMP aligns with the requirements of the current legislation and concerns the optimal management of expected waste with specific goals and actions. More specifically, in this section, the main obligations/requirements are analyzed, the integration of which determines the fundamental design principles of the Project's Waste Management System.

### 2.3.1 Urban Wastewater Flows

**Municipal Waste (MW)** is defined as::

1. Mixed waste and separately collected waste from households, including, among others, paper and cardboard, glass, metals, plastics, bio-waste, wood, textiles, packaging waste, waste electrical and electronic equipment, waste batteries and accumulators, and bulky waste, including mattresses and furniture.
2. Mixed waste and separately collected waste from other sources, when similar in nature and composition to household waste.

Municipal waste does not include waste from production, agriculture, forestry, fishing, septic tanks, and waste from sewer networks and waste treatment, including sewage sludge, end-of-life vehicles or construction and demolition waste.

Ο ορισμός αυτός ισχύει με την επιφύλαξη του καταμερισμού των ευθυνών για τη διαχείριση των αποβλήτων μεταξύ δημόσιων και ιδιωτικών φορέων. (Ν.4819/2021)

Municipal Waste (MW) includes the following:

- Bio-waste (BW)
- Recyclable Materials (RM) (paper, plastic, metal, glass – including packaging made of the respective materials)
- Packaging Waste (PW)
- Wood and Other Waste (WPBA, WEEE, bulky, inert, textiles, SQHW, etc.)

According to Article 25 of Law 4819/2021, **separate collection is applied at least for paper, metal, plastic, and glass**, and by January 1, 2024, **separate collection of textile products** will be established. Additionally, the following targets are set:

- Preparation for the reuse and recycling of waste materials, such as at least paper, metal, plastic, and glass from households and possibly from other sources, to the extent that these wastes are similar to household wastes, at least 50% by weight,
- The preparation for reuse, recycling, and recovery of other materials, including backfilling operations where waste is used to replace other materials, non-hazardous construction and demolition waste, excluding materials found in nature and classified under category 17 05 04 of the waste list, at least 70% by weight.
- By the end of 2025, the preparation for reuse and recycling of municipal waste will increase to at least 55% by weight,
- By the end of 2030, the preparation for reuse and recycling of municipal waste will increase to at least 60% by weight,
- By the end of 2035, the preparation for reuse and recycling of municipal waste will increase by at least 65% by weight.

For the separate collection of materials, bins or collection means of different colors are mandatorily used, in accordance with Article 26 of Law 4819/2021.

Additionally, regarding **packaging waste**, Article 84 of Law 4819/2021 provides for Extended Producer Responsibility (EPR) schemes for the promotion of high-quality recycling of packaging waste through separate collection into distinct streams for paper, metals, plastics, and glass in accordance with paragraph 1 of Article 25. The organization of the separate collection of individual packaging materials, such as glass, plastic, metals, and paper, is mandatory according to the provisions of the relevant Local Waste Management Plan and the approved Regional Waste Management Plan (RWMP).

According to Article 50 of Law 4819/2021, regarding **organic waste (biowaste)** (BW)<sup>3</sup>, it is stipulated that by December 31, 2022, organic waste **must either be separated and recycled at the source or collected separately** and not mixed with other types of waste in order to be recycled, including composting and digestion, in a manner that ensures a high level of environmental protection and that the resulting product meets the relevant high-quality standards. For this purpose, the first-level local authorities are responsible for organizing and operating the separate collection and transportation of these waste.

Regarding **single-use plastics**, Law 4736/2020 established measures to restrict and reduce their consumption, as well as Extended Producer Responsibility for specific plastic products.

From January 1, 2024 (Article 46 of Law 4819/2021), subject to the responsibility of the respective Alternative Management Systems (AMS), **hazardous waste produced by households**, such as hazardous waste from paints, varnishes, solvents, or cleaning products, must be collected separately under the care of the respective first-level Local Government Organization (LGO) at Green Points, and, in the event that the first-level LGO does not have a Green Point, at a suitably licensed location indicated by the respective Waste Management Organization (WMO). Organized management through the Alternative Management Systems for **Small Quantities of Hazardous Waste** at Households (AMSHW)<sup>4</sup> is currently carried out only for certain waste streams included in the AMSHW, specifically for lamps, small WEEE, and batteries/accumulators. Individual management is carried out through private initiatives for toners. The goal of the P.E.S.D.A. of Eastern Macedonia & Thrace Macedonia & Thrace is the organization of a separate collection system for small hazardous waste and diversion from landfilling.

According to the Waste Management Law, **bulky waste** included in the stream of household waste encompasses a wide range of items, such as—indicatively—furniture, mattresses, large packaging materials, bicycles, packaging pallets, and WEEE, large toys, suitcases, bicycles, carpets, strollers, etc. Bulky waste, according to the provisions of Law 4819/2021, is accepted at Green Points and Recycling Centers, Source Separation Education Centers (KEDISP). The goals of the Regional Waste Management Plan of Eastern Macedonia and Thrace include the creation of separate collection and management infrastructures for bulky waste, 100% diversion of bulky waste from landfilling, and the promotion of reuse and recycling. Macedonia & Thrace include the creation of separate collection and management infrastructure for bulky items, 100% diversion of bulky items from landfilling, and the promotion of reuse and recycling.

The separate collection of certain additional MW streams and similar waste is carried out through approved Alternative Management Systems (AMS). The following streams are covered:

- Waste Batteries and Accumulators (WB&A)
- Waste Electrical and Electronic Equipment (WEEE) – includes waste lighting equipment and lamps.
- Waste Lubricating Oils (WLO).
- Used Vehicle Tires (UVT).

Finally, according to the NWMP, the development of a separate collection network includes edible fats and oils, which must be collected separately and directed to biofuel production for energy recovery. The environmentally

<sup>3</sup> Biological waste (biowaste): biodegradable waste from gardens and parks, food and kitchen waste from homes, restaurants, catering facilities, and retail spaces, and related waste from food processing facilities.

<sup>4</sup> According to the Waste Framework Directive (WFD), the following are defined as hazardous waste: cleaning agents, disinfectants, batteries (WEEE), lamps, insect repellents, inks.

sound management of cooking oils requires their separate collection and delivery to licensed collection companies for their subsequent utilization. The RSWMP of Eastern Macedonia & Thrace provides for the separate collection of edible oil and fat waste to be implemented through special bins placed in appropriate locations within the municipalities (e.g. near large producers), as well as within green points.

In parallel with all the above, the "Pay-As-You-Throw" system (Art. 5, Law 4819/2021) is established, according to which waste producers are charged based on the actual quantity of waste they generate. In application of this system, the calculation of the unified municipal cleaning and lighting fee may also be based on waste generation per household or building complex, professional activity, urban or municipal unit, provided that the relevant first-level Local Government Authority has a system for measuring the generated waste or for one of the waste streams produced.

In addition to the above legal provisions, **the limitations of the municipal waste management system of the Municipality of Kavala** must be taken into account, which includes:

- Collection and management of mixed municipal waste: Collected in green bins and transported to the Kavala SL, where MW is subjected to mechanical sorting in a suitably dimensioned and licensed mobile unit.
- Collection and management of recyclable packaging (paper, plastic, metal): Collected in blue bins and transported to the Sorting Center for Recyclable Materials (SCRM) of Xanthi.
- Collection and management of glass packaging: Collected in bell-type containers serving mainly businesses, and further managed under the responsibility and supervision of the Hellenic Recovery Recycling Corporation SA (HRRC SA).
- Collection and management of clothing and textile waste: Collected through a network of metal collection bins and further managed under the responsibility and supervision of a suitably licensed private company.
- Collection and management of printed paper waste and paper/cardboard packaging: Collected in blue bins with yellow lids serving mainly the needs of commercial enterprises and school units, collected by the Cleaning Department of the Municipality of Kavala and forwarded to the SCRM of Xanthi.
- Collection and management of WEEE: Collected in bins for small electrical – electronic devices, installed in municipal buildings, and further managed under the responsibility and supervision of "Appliances Recycling SA".
- Collection and further management of Waste Lubricating Oils (WLO) generated from the activities of the Municipality of Kavala, used vehicle tires, bulky waste, green waste from gardening activities, and small quantities of C&DW, which derive from the MW stream during the collection process, by appropriately licensed entities.

Finally, according to the **National Waste Prevention Program (NWPP)**, food waste, Packaging Materials/Waste (PW), special categories of plastic products/waste (Plastic Carrier Bags (PCB) and Single-Use Plastic Products (SUPP)) are **priority waste streams** and may be relevant to the uses of the Project.

The adoption of NWPP measures and actions within the boundaries of the Project may contribute to achieving the targets set for the priority streams, such as:

- Reduction of (excessive) packaging and packaging waste.
- Promotion of bulk product purchasing over packaged products, particularly in relation to packaging waste generated during product distribution.



- Selection of reusable packaging.
- Selection of environmentally friendly packaging.
- Promotion of the substitution of single-use plastics with reusable or biodegradable materials.
- Promotion of the use of recycled plastic.
- Promotion of the creation of drinking water points to discourage the use of plastic bottles.
- Selection of materials and products made from recycled materials.
- Investigation of banning the use/consumption of plastic carrier bags.
- Substitution of plastic carrier bags with other materials that are biodegradable or environmentally friendly.
- Promotion of the use of reusable carrier bags.

The Project's WMP, in implementation of the above regarding the collection of MW streams, will include the following:

- The collection of MW within the Project will be carried out in two (2) separate streams: Recyclable Materials (paper/cardboard, plastic, metals, glass) and mixed waste.
- Separate collection will be carried out for the following additional MW streams, where they arise during the implementation of the Project:
  - Waste Streams subject to Alternative Management (Waste Portable Batteries<sup>5</sup>, Waste Electrical and Electronic Equipment – includes waste lighting equipment and lamps<sup>6</sup>, Waste Lubricating Oils, Used Vehicle Tires), Small Quantities of Hazardous Waste (SQHW).

### 2.3.2 Excavation, Construction and Demolition Waste (ECDW)

Regarding Excavation, Construction and Demolition Waste (ECDW), Article 30 of Law 4819/2021 provides that the management of ECDW from public or private projects or activities of category A' of Law 4014/2011 (A' 209) aims at their maximum possible utilization for the needs of the project. It provides for **separate sorting of at least the following: wood, inorganic fractions such as concrete, bricks, tiles and ceramics, stone, metals, glass, plastics, and gypsum, and is carried out preferably within the project site**, where technically feasible, in accordance with the provisions of the relevant Environmental and Social Impact Assessment (ESIA).

In addition, the management of surplus excavation materials with EWC code 17 05 04 (excavation materials managed outside the construction site) is carried out in accordance with the provisions of the Environmental Terms Approval Decision (ETAD) of the respective project. For the above excavation materials, as well as for ECDW managed within the construction site, no contract is required with Collective Alternative Management Systems (CAMS) or the establishment of an Individual Alternative Management System (IAMS), unless this is provided for in the relevant ETAD. For ECDW excluding EWC code 17 05 04, which is managed outside the construction site, the project or activity operator is required to enter into a cooperation agreement with an approved CAMS as an ECDW operator. The project operator is required to register in the Electronic Waste Register (EWR) the relevant data,

<sup>5</sup> SQHW

<sup>6</sup> SQHW

including data relating to construction and demolition waste (ECDW excluding EWC code 17 05 04) that is utilized within the construction site.

If the project or activity does not fall under category A' of Law 4014/2011, the project or activity operator is required to enter into a cooperation agreement with an approved CAMS as an ECDW operator for all ECDW it generates, including that with EWC code 17 05 04.

The Project's Waste Management Plan, in implementation of the above regarding the management of ECDW, is based on the following principles / assumptions:

- ECDW collection within the Project will be carried out separately by type of ECDW.
- ECDW will be utilized/reused for the needs of the project to the greatest possible extent.
- ECDW will in any case not be mixed with the MW streams.

### 2.3.3 Extractive Waste

Extractive waste<sup>7</sup> generated from offshore exploration, extraction, and processing of mineral resources is excluded from the scope of Law 4819/2021 and Joint Ministerial Decision 39624/2209/E103 (Government Gazette B/2076/25.9.2009) [Measures, conditions, and restrictions for the management of waste from the extractive industries, in compliance with the provisions of Directive 2006/21/EC of 15 March 2006 "on the management of waste from extractive industries and amending Directive 2004/35/EC" of the Council of 15 March 2006].

The management of extractive waste to be generated during the implementation of the Project will comply with the general specifications for the protection of the marine environment and will follow the guidelines of international and regional protocols, such as:

- The London Convention and the London Protocol on the prevention of marine pollution by dumping of wastes and other matter<sup>8</sup>.
- The Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean<sup>9</sup>, and more specifically the "Protocol for the Protection of the Mediterranean Sea against Pollution Resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil" (Offshore Protocol)<sup>10</sup>.

### 2.3.4 Hazardous Waste

The management of hazardous waste that may be generated during the implementation of the Project, which is not included in the waste categories analyzed above (MW, ECDW, Extractive Waste), will be carried out in accordance with applicable legislation, taking into account the objectives and provisions of the NWMP.

<sup>7</sup> Waste resulting from the prospecting, extraction, treatment, and storage of mineral resources and from the operation of quarries (Article 3, paragraph 2 of Joint Ministerial Decision 39624/2209/E103/2009 (Government Gazette 2076/B/25.09.2009))

<sup>8</sup> <https://www.imo.org/en/about/Conventions/pages/convention-on-the-prevention-of-marine-pollution-by-dumping-of-wastes-and-other-matter.aspx>

<sup>9</sup> <https://ypen.gov.gr/symvasi-tis-varkelonis-gia-tin-prostasia-tou-thalassiou-perivallontos-kai-ton-paraktion-periochon-tis-mesogeiou/>

<sup>10</sup> [https://wedocs.unep.org/bitstream/handle/20.500.11822/2961/94ig4\\_4\\_protocol\\_eng.pdf](https://wedocs.unep.org/bitstream/handle/20.500.11822/2961/94ig4_4_protocol_eng.pdf)



## 3 INTEGRATED WASTE MANAGEMENT

### 3.1 MUNICIPAL WASTE

#### 3.1.1 Type of Waste – Classification according to EWC

It is estimated that the Project will generate both non-hazardous and hazardous Municipal Waste (MW), as well as certain other waste streams falling under alternative management (management through AMS).

The categories of waste estimated to be generated during the implementation (construction and operation) of the Project, based on the European Waste Catalogue (EWC) (Decision 2001/118/EC, as amended and in force), are presented in the following table. It is noted that codes accompanied by an asterisk (\*) in addition to the number represent waste considered hazardous.

**Table 1-4: Classification of urban-type waste according to the EWC**

EWC Code	EWC Description
<b>15</b>	<b>WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED</b>
15 01	Packaging (including separately collected municipal packaging waste)
15 01 01	Paper and cardboard packaging
15 01 02	Plastic packaging
15 01 04	Metallic packaging
15 01 05	Composite packaging <sup>11</sup>
15 01 06	Mixed packaging
15 01 07	Glass packaging
15 01 10*	Packaging containing residues of or contaminated by hazardous substances
<b>19</b>	<b>19 WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTEWATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND INDUSTRIAL USE</b>
19 08	Wastes from wastewater treatment plants not otherwise specified
19 08 05	Sludges from treatment of urban wastewater
<b>20</b>	<b>MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS</b>
20 01	Separately collected fractions (except 15 01)
20 01 01	Paper and cardboard
20 01 02	Glass
20 01 13*	Solvents
20 01 14*	Acids
20 01 15*	Alkaline wastes
20 01 19*	Pesticides
20 01 21*	Fluorescent tubes and other mercury-containing waste
20 01 23*	Discarded equipment containing chlorofluorocarbons
20 01 25	Edible oils and fats
20 01 27*	Paints, inks, adhesives and resins containing hazardous substances

<sup>11</sup> Beverage packaging (e.g. Tetra Pak), snack packaging (e.g. chips, cheese puffs), blister packs.

EWC Code	EWC Description
20 01 29*	Detergents containing hazardous substances
20 01 33	Batteries and accumulators referred to in 16 06 01, 16 06 02 or 16 06 03 and mixed batteries and accumulators containing such batteries
20 01 34	Batteries and accumulators other than those mentioned in 20 01 33
20 01 35*	Discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components
20 01 36	Discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35
20 01 37*	Wood containing hazardous substances
20 01 39	Plastics
20 01 40	Metals
20 03	Other municipal wastes
20 03 01	Mixed municipal waste
20 03 04	Septic tank sludge

It is noted that the classification of waste, i.e. the identification of hazardous properties through the assessment of waste hazardousness and, ultimately, their classification as hazardous or non-hazardous, shall be carried out in accordance with the provisions of the “Commission Notice on technical guidance on the classification of waste” (2018/C 124/01) (see §1.4.1), based on the Waste Framework Directive 2008/98/EC, which has been transposed into Greek legislation through Law 4819/2021 (Government Gazette 129/A/23.07.2021), and Regulation (EC)<sup>12</sup> No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (CLP Regulation).

### 3.1.2 Estimated Quantities

This section presents the estimates made for the generation of municipal waste from the Project, which are based on a series of assumptions.

#### Construction Phase

- Duration of construction works
  - Onshore facilities: 3 months (60 working days).
  - CO<sub>2</sub> pipeline: 9 months (180 working days).
  - Modification of existing offshore Prinos facilities to receive CO<sub>2</sub> from the new subsea CO<sub>2</sub> pipeline and for injection into new wells: 4 months (80 working days).
  - Well drilling: 8 months (160 working days).
  - Total construction duration: 14 months (worst-case scenario for MW estimation).
- Average number of workers per day:
  - Onshore facilities: 10.
  - CO<sub>2</sub> pipeline: 200.
  - Modification of existing offshore facilities: 20.

<sup>12</sup> Current consolidated version: 01/12/2023: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02008R1272-20231201>

- Well drilling: 90.
- Daily MW generation rate: 0.4 kg/person.
- Qualitative composition of MW based on NWMP<sup>13</sup> estimates.
- Separate collection of recyclable materials (paper and cardboard, metals, plastics, glass).
- Specific weight per type of MW:
  - Paper/cardboard: 0.20 tn/m<sup>3</sup>
  - Plastics: 0.22 tn/m<sup>3</sup>
  - Metals: 0.23 tn/m<sup>3</sup>
  - Glass: 0.33 tn/m<sup>3</sup>
  - Other – mixed: 0.26 tn/m<sup>3</sup>
- Recyclable waste recovery rate per MW stream:
  - Paper/cardboard: 85%
  - Plastics: 50%
  - Metals: 70%
  - Glass: 60%

Based on the above, Table 15 presents the estimated total quantity of MW during the construction phase of the Project, as well as the average daily quantities of MW generated. Additionally, the maximum expected MW generation is presented, which corresponds to a simultaneous daily presence of 188 workers.

**Table 1-5: Estimation of Produced Quantities MW - Construction Phase**

NW Generation		Mixed	Recyclables	Total	Unit
Total Generation (14 months)	MW Generation (tn)	14,19	6,85	<b>21,04</b>	<b>tn</b>
	MW Generation (m <sup>3</sup> )	54,57	32,22	<b>86,79</b>	<b>m<sup>3</sup></b>
Average Daily Generation	Average Daily MW Generation (tn/d)	0,05	0,02	<b>0,08</b>	<b>tn/d</b>
	Average Daily MW Generation (m <sup>3</sup> /d)	0,19	0,12	<b>0,31</b>	<b>m<sup>3</sup>/d</b>
Maximum Daily Generation	Maximum Daily MW Generation (tn/d)	0,08	0,04	<b>0,12</b>	<b>tn/d</b>
	Maximum Daily MW Generation (m <sup>3</sup> /d)	0,30	0,18	<b>0,48</b>	<b>m<sup>3</sup>/d</b>

As regards other urban-type waste streams (waste streams subject to Alternative Management, Small Quantities of Hazardous Waste (SQHW), etc.), the permanent generation of which is not expected during the operation of the Project based on the data available at this stage, the estimation of the quantities to be generated is not feasible.

Finally, as regards domestic wastewater from workers' accommodation, it is estimated that:

- during the construction phase at the onshore facilities site, approximately **12 m<sup>3</sup>** of domestic wastewater will be generated,

<sup>13</sup> NSWMAP MD Act 39 of 31.8.2020 (OG A' 185/29.9.2020), as amended by the Cabinet Act No. 5 of 18.4.2023 (OG A' 94/18.4.2023).

- during the well drilling construction phase, approximately **200 m<sup>3</sup>** of domestic wastewater will be generated, and
- during the CO<sub>2</sub> pipeline construction phase, approximately **30 m<sup>3</sup>** of domestic wastewater will be generated.

The domestic wastewater will be discharged to the existing Wastewater Treatment Plant (WWTP) of the Sigma installation. Other liquid wastes expected to be generated by the specialised pipelay and trenching vessel, along with the two supply/tug support vessels during the construction of the CO<sub>2</sub> pipeline, include bilge water and ballast water. Water from the engine room may contain grease and/or oils (bilge water). The management of bilge water will be carried out in accordance with Annex I of MARPOL 73/78 (Regulations for the Prevention of Pollution by Oil) and its relevant amendments. The treatment equipment (bilge water separator) will comply with the IMO Guidelines and Specifications for Pollution Prevention Equipment for Machinery Space Bilges of Ships (IMO Resolution MEPC.107(49)). The discharge of ballast water used for vessel stability at sea is subject to the requirements of Annex I of MARPOL 73/78 and the International Convention for the Control and Management of Ships' Ballast Water and Sediments (Ballast Water Management – BWM). The treatment equipment (ballast water treatment system) will comply with Standard D-2, which concerns the treatment of marine ballast water.

#### Operation Phase

- Average number of workers per day: 46
- Daily MW generation rate: 0.4 kg/person
- Qualitative composition of MW based on NWMP<sup>14</sup> estimates
- Separate collection of recyclable materials (paper and cardboard, metals, plastics, glass)
- Specific weight per type of MW:
  - Paper/cardboard: 0.20 tn/m<sup>3</sup>
  - Plastics: 0.22 tn/m<sup>3</sup>
  - Metals: 0.23 tn/m<sup>3</sup>
  - Glass: 0.33 tn/m<sup>3</sup>
  - Other – mixed: 0.26 tn/m<sup>3</sup>
- Recyclable waste recovery rate per MW stream:
  - Paper/cardboard: 85%
  - Plastics: 50%
  - Metals: 70%
  - Glass: 60%

Based on the above, **Table 16** presents the estimated annual quantity of MW during the operation phase of the Project as well as the average daily quantities of MW generated.

**Πίνακας 3-1: Εκτίμηση παραγόμενων ποσοτήτων ΑΑ - Φάση Λειτουργίας**

NW Generation		Mixed	Recyclables	Total	Unit
<b>Annual Generation</b>	MW Generation (tn)	14,19	6,85	<b>21,04</b>	<b>tn</b>

<sup>14</sup> NSWM Ministerial Act No. 39 of 31.8.2020 (Government Gazette 185/A/29.9.2020), as amended by the Cabinet Act No. 5 of 18.4.2023 (Government Gazette 94/A/18.4.2023).

NW Generation		Mixed	Recyclables	Total	Unit
	MW Generation (m <sup>3</sup> )	54,57	32,22	<b>86,79</b>	<b>m<sup>3</sup></b>
Average Daily Generation	Average Daily MW Generation (tn/d)	0,012	0,006	<b>0,02</b>	<b>tn/d</b>
	Average Daily MW Generation (m <sup>3</sup> /d)	0,048	0,028	<b>0,08</b>	<b>m<sup>3</sup>/d</b>

As regards other urban-type waste streams (waste streams subject to Alternative Management, Small Quantities of Hazardous Waste (SQHW), etc.), the permanent generation of which is not expected during the operation of the Project based on the data available at this stage, the estimation of the quantities to be generated is not feasible.

### 3.1.3 Waste Management Plan

The plan for managing the waste generated by the Project (urban-type waste and other waste streams of similar nature arising during construction and operation) was developed based on the requirements of §1.2.3. It is noted that the management (separate collection, temporary storage) of waste within the boundaries of the Project was selected, with the aim of promoting the basic principles of waste management (§1.2.1).

The waste stream management approach is presented in the following table.

**Table 1-7: Mapping of an Integrated Waste Management System - Municipal Waste**

EWC Code	EWC Description	Description of the type of waste	Waste Stream Management		
			Collection/Temporary Storage within the Project	Temporary Storage Equipment within the Project	Collection (Transportation) / Treatment <sup>15</sup>
20 03 01	mixed municipal waste	Mixed municipal waste	Separate collection of mixed municipal waste / Temporary storage within the Project	Mixed Waste Bin (plastic bin EN 840-2/5/6, capacity 80 to 1100 liters)	Responsible LGO or collection and transportation agency – <i>in case it is not feasible, the disposal of waste by the Project Agency should be provided for in the existing collection system of the LGO / Kavala Landfill.</i>
19 08 05	sludge from the treatment of urban wastewater	Sludge from the Sigma WWTP from the treatment of urban wastewater of the Project	-	-	Licensed entity for collection, transportation, and management
15 01 01	packaging made of paper and cardboard	Mixed recyclable materials from paper/cardboard, plastic, metal, and glass <sup>16</sup>	Separate collection of recyclable materials / Temporary storage within the Project	Recyclable Materials Bin (plastic bin EN 840-2/5/6, capacity 80 to 1100lt)	Competent LGO or collection and transportation agency – <i>in case it is not feasible, the disposal of waste by the Project Agency should be provided for in the existing collection system of the LGO</i>
15 01 02	plastic packaging				
15 01 04	metal packaging				

<sup>15</sup> "Treatment": operations of recovery or disposal, including preparation prior to recovery or disposal (Law 4819/2021)

<sup>16</sup>

<https://www.eoan.gr/%ce%b5%ce%bd%ce%b7%ce%bc%ce%ad%cf%81%cf%89%cf%83%ce%b7/%cf%84%ce%b9-%cf%85%ce%bb%ce%b9%ce%ba%ce%ac-%ce%b1%ce%bd%ce%b1%ce%ba%cf%85%ce%ba%ce%bb%cf%8e%ce%bd%ce%bf%cf%85%ce%bc%ce%b5/>

EWC Code	EWC Description	Description of the type of waste	Waste Stream Management		
			Collection/Temporary Storage within the Project	Temporary Storage Equipment within the Project	Collection (Transportation) / Treatment <sup>15</sup>
<b>15 01 05</b>	synthetic packaging <sup>17</sup>				/ Recycling Material Sorting Center (RMSC) of Xanthi.
<b>15 01 06</b>	mixed packaging <sup>18</sup>				
<b>15 01 07</b>	glass containers				
<b>20 01 01</b>	paper and cardboard				
<b>20 01 02</b>	glass				
<b>20 01 39</b>	plastics				
<b>20 01 40</b>	metals				
<b>20 01 25</b>	edible oils and fats	Edible oils and fats. <i>Permanent production during the implementation of the Project is not foreseen. In any case, and if the need arises, the produced quantities should be temporarily stored in the project's temporary waste storage area.</i>	Separate collection of edible oils and fats / Temporary storage within the Project *if the need arises	Container for Collecting Edible Oils and Fats (Intermediate Bulk Container (IBC) or UN HDPE barrel, capacity from 30 to 220 liters) *if necessary	Licensed entity for collection, transportation, and management *if necessary
<b>20 01 23*</b>	discarded equipment containing chlorofluorocarbons	Waste Electrical and Electronic Equipment (WEEE).	Separate collection of WEEE / Temporary storage within the Project	WEEE Bin (plastic bin EN 840-2/5/6, capacity 80 to 1100 liters or WEEE Bin	Collection and transportation entity / WEEE compliance scheme

<sup>17</sup> Beverage packaging (Tetra Pak type), snack packaging (e.g., potato chips, cheese puffs), tablet packaging.

<sup>18</sup> Mixed packaging: packaging consisting of two or more layers of different materials that cannot be separated by hand and constitute a single integrated unit consisting of an inner receptacle and an outer casing, which is filled, stored, transported, and emptied as a single unit, DIRECTIVE (EU) 2018/852.

EWC Code	EWC Description	Description of the type of waste	Waste Stream Management		
			Collection/Temporary Storage within the Project	Temporary Storage Equipment within the Project	Collection (Transportation) / Treatment <sup>15</sup>
<b>20 01 35*</b>	discarded electrical and electronic equipment, except for those mentioned in 20 01 21 and 20 01 23 that contain hazardous components	<i>Permanent production of WEEE during the implementation of the Project is not anticipated. In any case, and if the need arises, the produced quantities should be temporarily stored in the project's temporary waste storage area.</i>	*if necessary	from an approved EPR scheme) *if the need arises	- in case it is not feasible, the disposal of waste by the Project entity should be provided for at appropriate WEEE recycling points of the compliance schemes. *if necessary
<b>20 01 36</b>	discarded electrical and electronic equipment, except for that referred to in 20 01 21, 20 01 23, and 20 01 35				
<b>20 01 33</b>	batteries and accumulators referred to in 16 06 01, 16 06 02, or 16 06 03 and mixed batteries and accumulators containing the aforementioned batteries	Waste from Electric Batteries (batteries) & Accumulators (WEEE)	Separate collection of WEBA / Temporary storage within the Project	LSSA Bin (LSSA bin from an authorized Collective Compliance Scheme)	Collection and transport entity / LSSA Collective Compliance Scheme
<b>20 01 34</b>	batteries and accumulators other than those mentioned in 200133				
<b>20 01 21*</b>	fluorescent tubes and other mercury-containing waste	Waste from Lighting Fixtures, Bulbs, and Small Appliances WEEE. <i>Permanent production of WEEE during the implementation of the Project is not foreseen. In any case, and if the need arises, the produced quantities should be temporarily stored in the project's temporary waste storage area.</i>	Separate collection of lighting fixtures, bulbs, and small appliances / Temporary storage within the Project *if necessary	Luminaires and Lamps Collection Bin (WEEE bin from an authorized Collective Compliance Scheme) *if necessary	Collection and transport entity / WEEE Collective Compliance Scheme – in case this is not feasible, provision shall be made for the disposal of the waste by the Project Entity at appropriate WEEE recycling points of the Collective Compliance Schemes. *if necessary
<b>20 01 13*</b>	solvents	SQHW (Small Quantities of Hazardous Waste in the MW). <i>Permanent production during the implementation of the Project is not anticipated. In any case, and if the need arises, the produced quantities should be temporarily stored separately for each type in</i>	Separate collection / Temporary storage within the Project *if necessary	Suitable separate container for each type (plastic container EN 840-2/5/6, capacity 80 to 1100lt or UN HDPE barrel, UN metal barrel, etc.) *if necessary	Licensed entity for the collection, transportation, and management of Hazardous Waste *if necessary
<b>20 01 14*</b>	acids				
<b>20 01 15*</b>	alkaline waste				
<b>20 01 19*</b>	pesticides				



EWC Code	EWC Description	Description of the type of waste	Waste Stream Management		
			Collection/Temporary Storage within the Project	Temporary Storage Equipment within the Project	Collection (Transportation) / Treatment <sup>15</sup>
<b>20 01 27*</b>	paints, inks, glues, and resins that contain hazardous substances	<i>the temporary waste storage area of the Project.</i>			
<b>20 01 29*</b>	detergents that contain hazardous substances				
<b>20 01 37*</b>	wood that contains hazardous substances				
<b>15 01 10*</b>	packaging that contains residues of hazardous substances or has been contaminated by them	Empty paint cans, solvents, etc. <i>Permanent production during the implementation of the Project is not foreseen. In any case, and if the need arises, the produced quantities should be temporarily stored separately for each type in the project's temporary waste storage area and managed as hazardous waste.</i>	Separate collection / Temporary storage within the project *if necessary	UN HDPE barrel, UN metal barrel *if necessary	Licensed entity for the collection, transportation, and management of Hazardous Waste *if necessary
<b>20 03 04</b>	septic tank sludge	Wastewater from construction site chemical toilets	-	-	Collection and transportation agency

It is noted that, through the electronic services of the Electronic Waste Registry (HMA), it is possible to search, based on the EWC code(s), for the corresponding licensed waste collection and transport operators per regional unit.

## 3.2 CONSTRUCTION WASTE

### 3.2.1 Type of Waste – Classification according to EWC

The integrated management of C&DW related to the construction works and excavation activities of the Project is carried out in accordance with Joint Ministerial Decision 36259/1757/E103/2010 (Government Gazette 1312/B/24.08.2010) "Measures, conditions and programme for the alternative management of construction and demolition waste (C&DW)" and the relevant provisions of Law 4819/2021, as amended and in force.

It is estimated that the Project will generate C&DW subject to alternative management (via Collective Alternative Management Systems - CAMS) as well as other waste, hazardous and non-hazardous, such as construction residues (e.g., concrete, metals, packaging materials, etc.) and surplus materials from site preparation and construction activities.

The types of waste arising from the construction works and estimated to be generated during the construction phase of the Project are presented in the following table, based on the European Waste Catalogue (Decision 2001/118/EC, as amended and in force). It is noted that codes accompanied by an asterisk (\*) denote waste classified as hazardous.

**Table 1-8: Classification of construction waste according to the EWC**

EWC CODE	Description
<b>08</b>	<b>WASTES FROM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS), ADHESIVES, SEALANTS AND PRINTING INKS</b>
<b>08 01</b>	Wastes from MFSU and removal of paint and varnish
<b>08 01 11*</b>	Waste paint and varnish containing organic solvents or other hazardous substances
<b>08 04</b>	Waste paint and varnish containing organic solvents or other hazardous substances
<b>08 04 09*</b>	Waste adhesives and sealants containing organic solvents or other hazardous substances
<b>10</b>	<b>WASTES FROM THERMAL PROCESSES</b>
<b>10 13</b>	Wastes from cement, lime and plaster production and products made from them
<b>10 13 14</b>	Waste concrete and concrete sludge
<b>13</b>	<b>OIL WASTES AND WASTES OF LIQUID FUELS (EXCEPT EDIBLE OILS, AND THOSE IN CHAPTERS 05, 12 AND 19)</b>
<b>13 01</b>	Waste hydraulic oils
<b>13 01 11*</b>	Synthetic hydraulic oils
<b>13 02</b>	Waste engine, gear and lubricating oils
<b>13 02 06*</b>	Synthetic engine, gear and lubricating oils
<b>13 05</b>	Oil/water separator contents
<b>13 05 07*</b>	Oily water from oil/water separators
<b>15</b>	<b>WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED</b>
<b>15 02</b>	Absorbents, filter materials, wiping cloths and protective clothing

EWCODE	Description
15 02 02*	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths and protective clothing contaminated by hazardous substances
17	<b>CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)</b>
17 01	Concrete, bricks, tiles and ceramics
17 01 01	Concrete
17 02	Wood, glass and plastic
17 02 01	Wood
17 02 04*	Glass, plastic and wood containing or contaminated with hazardous substances
17 04	Metals (including their alloys)
17 04 05	Iron and steel
17 04 09*	Metal waste contaminated with hazardous substances
17 05	Soil (including excavated soil from contaminated sites), stones and dredging spoil
17 05 04	Soil and stones other than those mentioned in 17 05 03
17 05 06	Dredging spoil other than those mentioned in 17 05 05

It is emphasized that the classification of waste, i.e., the identification of hazardous properties through the assessment of the waste's hazard and, ultimately, their classification as hazardous or non-hazardous, shall be carried out in accordance with the provisions of the "Commission Notice on technical guidance on the classification of waste" (2018/C 124/01) (see §1.4.1), based on the Waste Framework Directive 2008/98/EC (WFD), which has been transposed into Greek legislation by Law 4819/2021 (Government Gazette 129/A/23.07.2021) and the CLP Regulation "Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006."

### 3.2.2 Εκτιμώμενες Ποσότητες

#### 4 Estimated Quantities

According to initial estimates, the surplus excavation materials from the earthworks of the Project site amount to approximately 200 m<sup>3</sup>. Excavations will be limited to the absolute necessary, while surplus material will be reused as a priority for embankment needs within the framework of the Project construction.

Beyond the excavation surplus, other generated C&DW from construction activities are difficult to estimate at this stage, given that there is no corresponding calculation model.

It is noted that construction waste may contain small quantities of hazardous or toxic materials. Hazardous materials that may be found on construction sites include:

- Solvent-based concrete additives
- Chemicals for moisture protection
- Adhesives
- Bitumen-based emulsions
- Asbestos-based materials

- Mineral fibers (insulation)
- Paints and coating layers
- Treated wood
- Resins
- Plasterboards

Table 19 records the possible hazardous constituents in the construction waste stream and their potential hazardous properties.

**Table 1-9: Hazardous Components in C&D Waste (CDW)**

Product / Material	Possible Hazardous Components	Potential Hazardous Properties
Concrete additives	Hydrocarbon solvents	Flammable
Moisture-resistant materials	Solvents, bitumen	Flammable, Toxic
Adhesives	Solvents, isocyanate compounds	Flammable, Toxic, Irritant
Protective coatings, sealants	Solvents, bitumen	Flammable, Toxic
Road coating materials	Tar-based emulsions	Toxic
Asbestos	Fibres that can penetrate the respiratory system	Toxic, Carcinogenic
Mineral fibres	Fibres that can penetrate the respiratory system	Skin and respiratory irritation
Treated wood	Copper, arsenic, chromium, tar, biocides, fungicides	Toxic, Ecotoxic, Flammable
Paints and coating layers	Lead, chromium, vanadium-based solvents	Toxic, Flammable
Power transmission equipment	PCBs	Ecotoxic
Light source	PCBs, mercury, sodium	Toxic, Ecotoxic
Ventilation systems	CFCs	Ozone-depleting
Fire protection systems	CFCs	Ozone-depleting
Contaminated woven fibres used in construction	Radionuclides	Toxic
	Heavy metals including cadmium, mercury	Toxic
	Carbon	Toxic
Animal by-products	Carbon	Toxic
Gas cylinders	Propane, butane, acetylene	Flammable
Insulation fibres	Isocyanate compounds, phthalic anhydride	Toxic, Irritant
Oils and fuels	Hydrocarbons	Flammable, Ecotoxic

Product / Material	Possible Hazardous Components	Potential Hazardous Properties
Plasterboards	Possible source of H <sub>2</sub> S in the disposal area	Flammable, Toxic
Glass	-	-
Roads	Tar, solvents	Flammable, Toxic
Ash/clinker substrate	Heavy metals including mercury and copper	Toxic

It is noted that the types and quantities of hazardous materials in the C&DW (Construction and Demolition Waste), which may be generated during the construction phase of the Project, cannot be estimated at present due to the early stage of the Project's study.

Other hazardous wastes expected to be produced in small quantities during the construction phase mainly include wastes containing oil, sewage sludge, oily waters from oil separators, water, absorbent materials, filter materials, packaging, etc. The sacks and pallets from the chemicals to be used for the preparation of the drilling mud during the drilling of wells are estimated at 1 ton.

### 4.1.1 Management Plan

The primary objective of the integrated management of the Project's C&DW is to promote the on-site utilization of the maximum possible quantity of construction materials and the recycling of the remainder, as well as the reuse of excavation materials. In any case, through appropriate mechanisms, the reuse, recycling, and recovery of construction wastes will be promoted, reducing the percentage that ends up in landfills and contributing to the achievement of the national target for the reuse, recycling, recovery, and utilization of at least 70% of C&DW by total weight of those produced in the country<sup>19</sup>.

The plan for managing the generated C&DW of the Project and other wastes arising from the construction works was formulated based on the requirements of §1.2.3. It is noted that the management (separate collection, temporary storage) of wastes within the boundaries of the Project was selected, aiming at the promotion of the basic principles of waste management (§1.2.1).

The presentation of the management method for the waste streams is given in the following table.

Πίνακας 3-2: Αποτύπωση ολοκληρωμένου συστήματος διαχείρισης αποβλήτων από κατασκευαστικές εργασίες

EWC Code	EWC Description	Waste Type Description	Waste Stream Management		
			Collection/Temporary On-Site Storage	Temporary On-Site Storage Equipment	Removal (Transport) / Treatment <sup>20</sup>
17 01 01	concrete	Concrete from demolitions. <i>No production is foreseen during Project implementation. In any case, if required, the quantities generated must be temporarily stored in the Project's waste temporary storage area.</i>	Separate collection of concrete from demolitions / Temporary on-site storage *if required	Concrete container (Skip Lift Container) *if required	Reuse – recycling on-site or authorized collection & transport operator / CWCS *if required

<sup>19</sup> Naturally occurring inert materials (soils and stones, EWC 17 05 04) resulting from excavation works are excluded from the target calculation.

<sup>20</sup> "Treatment": Recovery or disposal operations, including preparation prior to recovery or disposal (Law 4819/2021).

EWC Code	EWC Description	Waste Type Description	Waste Stream Management		
			Collection/Temporary On-Site Storage	Temporary On-Site Storage Equipment	Removal (Transport) / Treatment <sup>20</sup>
17 02 01	wood	Wood. <i>No production is foreseen during Project implementation. In any case, if required, the quantities generated must be temporarily stored in the Project's waste temporary storage area.</i>	Separate collection of wood / Temporary on-site storage *if required	Wood container (Skip Lift Container) *if required	Reuse on-site or authorized collection & transport operator / CWCS * if required
17 02 04*	glass, plastic and wood containing or contaminated with hazardous substances	Wood containing or contaminated with hazardous substances. <i>No production is foreseen during Project implementation. In any case, if required, the quantities generated must be temporarily stored in the Project's waste temporary storage area and managed as hazardous waste.</i>	Separate collection of hazardous wood / Temporary on-site storage *if required	Hazardous wood container (Skip Lift Container) *if required	Authorized hazardous waste collection, transport, and management contractor *if required
17 04 05	iron and steel	Iron and steel (metal waste)	Separate collection of iron/steel / Temporary on-site storage	Iron/steel container (Skip Lift Container or metal container EN 840-2/5/6)	Reuse on-site or authorized collection & transport operator / CWCS
17 04 09*	metal waste contaminated with hazardous substances	Metals contaminated with hazardous substances. <i>No production is foreseen during Project implementation. In any case, if required, the quantities generated must be temporarily stored in the Project's waste temporary storage area and managed as hazardous waste.</i>	Separate collection of hazardous metals / Temporary on-site storage *if required	Hazardous metals container (Skip Lift Container or metal container EN 840-2/5/6) *if required	Authorized hazardous waste collection, transport, and management contractor *if required
17 05 04	soil and stones other than those mentioned in 17 05 03	Excavation soil waste	Separate collection of excavated material / Temporary on-site storage	Bulk – Temporary stockpile near the Project site area	Reuse on-site or authorized collection and transport operator / Disposal at approved suitable sites (e.g. quarries, landfills) in accordance with the Project's EIA Approval Decision or CWCS

EWC Code	EWC Description	Waste Type Description	Waste Stream Management		
			Collection/Temporary On-Site Storage	Temporary On-Site Storage Equipment	Removal (Transport) / Treatment <sup>20</sup>
08 01 11*	waste from paints and varnishes containing organic solvents or other hazardous substances	<i>Permanent production during Project implementation is not foreseen. In any case, if required, the quantities generated</i>	Separate collection /	Appropriate separate container for each type (plastic bin EN 840-2/5/6, capacity 80 to 1100 L, or UN HDPE or UN metal drum, etc.) required	Authorized hazardous waste collection, transport, and management contractor *if required
08 04 09*	waste adhesives and sealants containing organic solvents or other hazardous substances				
10 13 14	waste concrete and concrete slurry	Waste from concrete production <i>No production is foreseen during Project implementation. In any case, if required, the quantities generated must be temporarily stored in the Project's waste temporary storage area and managed as hazardous waste.</i>	Separate waste collection / no temporary storage *if required	-	Collection and Management by the supplier/contractor or Authorized collection & transport operator / CWCS
13 01 11*	synthetic hydraulic oils	Waste Lubricating Oils (WLO)	Separate collection of Lubricating Oils / Temporary on-site storage	Lubricating Oil Container (UN metal drum)	Collection and transport contractor / Lubricating Oils Collective Compliance Scheme (LOCCS)
13 02 06*	synthetic engine, gear, and lubricating oils				
13 05 07*	oily water from oil/water separators				



EWC Code	EWC Description	Waste Type Description	Waste Stream Management		
			Collection/Temporary On-Site Storage	Temporary On-Site Storage Equipment	Removal (Transport) / Treatment <sup>20</sup>
15 02 02*	absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by hazardous substances	Oily rags, oil filters. <i>Permanent production during Project implementation is not foreseen. In any case, if required, the quantities generated must be stored temporarily and separately per type in the Project's waste temporary storage area and managed as hazardous waste.</i>	Separate collection / Temporary on-site storage *if required	UN HDPE drum, UN metal drum, portable pollution response unit containing big bags for waste placement *if required	Authorized hazardous waste collection, transport, and management contractor *if required
-	-	Other construction waste not included in this plan that may contain small quantities of hazardous or toxic substances (e.g., concrete additives with solvents, adhesives, bitumen emulsions, paints and coatings, packaging, etc. (see §1.3.2.1)). <i>If such waste is generated during Project implementation, it must be classified based on the EWC, temporarily stored in the Project's waste temporary storage area, and managed as hazardous waste.</i>	Separate collection per type / Temporary on-site storage *if required	Suitable hazardous waste temporary storage equipment (Intermediate Bulk Container (IBC) or UN HDPE drum, etc.) *if required	Authorized hazardous waste collection, transport, and management contractor *if required

It is noted that through the electronic services of the Electronic Waste Registry (HMA), it is possible to search by the European Waste Catalogue (EWC) code or codes for the corresponding licensed waste collection and transport entities per regional unit.

The management of Construction and Demolition Waste (C&DW) in the Region of Eastern Macedonia and Thrace is carried out according to the provisions of Joint Ministerial Decision (JMD) 36259/1757/E103/2010 through the following Alternative Management Systems (based on data from the Hellenic Recycling Agency – EOAN<sup>21</sup>):

- Collective Alternative Management System (CAMS) “Northern Greece Aggregate Recycling S.A.”, trade name “AN.A.V.E. S.A.”.
- CAMS “Central Macedonia C&DW Recycling S.A.”, trade name “ANA.KE.M.”.
- CAMS “Central Greece Recycling System Ltd.”, trade name “S.AN.K.E. Ltd.”.

<sup>21</sup> <https://www.eoan.gr>

- CAMS “PEDMEDE ECO Limited Liability Company”, trade name “PEDMEDE ECO M.E.P.E.”.

## 4.2 DRILLING WASTE

### 4.2.1 Waste Type – Classification by EWC

Drilling activities generate mining waste, both hazardous and non-hazardous, primarily consisting of drilling cuttings and drilling muds.

Drilling muds are categorized based on their main component, which can be oil-based, water-based, or synthetic substances. To produce drilling muds, a combination of materials and chemicals is used to achieve desired properties (such as specific gravity, viscosity, etc.). For the implementation of the Project, water-based/lime mud, oil-based mud, and oil-based/water-based mud will be used. Cuttings consist of fragments of geological formations penetrated by the drill string, separated during the removal of solids from the recirculating drilling fluid flow through a series of physical processes, and are temporarily stored in special closed containers. Subsequently, the drilling muds are temporarily stored in special mud tanks and reused in further drilling operations until no longer needed or depleted.

It is noted that the primary drilling section will be 16 inches, drilled from approximately 350 m to a depth of 2,200 m. In this section, a water-based mud with seawater and lime will be used, which is biodegradable and environmentally non-harmful. The geological formation in this section is uniform and consists of sandstone and clay layers; from all wells drilled in the area, no traces of hydrocarbons have ever been observed at these depths. The cuttings from this section will be deposited on the seabed, while below approximately 2,200 m depth, drilling fluids will return to the surface where cuttings will be removed and mud will be processed. It will be ensured that the constituents of the water-based muds are not harmful to the environment, and a record of these constituents with their safety data sheets (MSDS) will be maintained. Provided the above conditions are met, cuttings resulting from the use of these water-based muds may be disposed of on the seabed.

Regarding cuttings containing hydrocarbons due to oil-based muds, they will be separated at the drilling unit and transferred to a management system located at the drilling facility. The cuttings undergo centrifugation to remove most of the mud and then are dried. The dry cuttings are placed in containers and transported onshore for further management by a certified waste management contractor. Drilling muds are temporarily stored in special mud tanks and reused until depleted. The exhausted mud is transferred to onshore facilities, and final management is carried out by a licensed waste collection, transport, and management entity.

During the cementing stage of the drilling, since drilling mud and cement slurry are displaced sequentially, an intermediate spacer fluid (CaCl<sub>2</sub> brine), known as a spacer, is interposed to ensure effective displacement and prevent contamination between the two fluids (drilling fluids and slurry). The spacer fluid displaces the drilling fluid, which is then displaced by cement injection without leaving a passage between them.

The categories of mining wastes expected to be generated during the Project construction phase based on the European Waste Catalogue (EWC) are presented in the following table. Codes with an asterisk (\*) indicate wastes classified as hazardous.

Table 3-3: Classification of Drilling Waste According to the European Waste Catalogue (EWC)

EWC Code	EWC Description
<b>01</b>	<b>WASTES FROM PROSPECTION, MINING, QUARRYING AND PHYSICAL AND CHEMICAL TREATMENT OF MINERALS</b>
<b>01 05</b>	drilling muds and other drilling wastes
<b>01 05 04</b>	muds and wastes from water drilling (fresh water drilling muds and wastes applies to water-based mud/fluids)
<b>01 05 05*</b>	oil-containing drilling muds and waste
<b>01 05 06*</b>	drilling muds and other drilling wastes containing hazardous substances
<b>01 05 07</b>	barite-containing drilling muds and wastes other than those mentioned in 01 05 05 and 01 05 06
<b>01 05 08</b>	chloride-containing drilling muds and wastes other than those mentioned in 01 05 05 and 01 05 06
<b>17</b>	<b>CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)</b>
<b>17 01</b>	concrete, bricks, tiles and ceramics
<b>17 01 01</b>	concrete

It is noted that the classification of waste, i.e., the determination of hazardous properties through the hazard assessment of the waste and ultimately their classification as hazardous or non-hazardous, will be carried out in accordance with the provisions of the “Commission Notice on technical guidance for the classification of waste” (2018/C 124/01) (see §1.4.1), based on the Waste Framework Directive 2008/98/EC (WFD), which has been incorporated into Greek legislation by Law 4819/2021 (Government Gazette 129/A/23.07.2021) and the CLP Regulation

“Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labeling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.”.

## 4.2.2 Estimated Quantities

It is estimated that the drilling muds produced during the construction of the Project will amount to 1,540 m<sup>3</sup> per well.

In a typical well for the CO<sub>2</sub> storage project, approximately 650 m<sup>3</sup> of cuttings are generated; therefore, for the planned four (4) wells, approximately 2,700 m<sup>3</sup> of solid waste will be produced. The drilling operations in the Project generate small volumes of residues, as all planned wells are of small diameter and side drilling type.

Table 1-12: Estimated Quantities of Drill Cuttings per Drilling Section

Borehole Section (in)	MD (m)	Mud Type	Specific Gravity (SG)	Mud Volume per Well (m <sup>3</sup> )	Cuttings Volume per Well (m <sup>3</sup> )	Total Cuttings Volume (4 Wells) (m <sup>3</sup> )
16	1850	Water-based / Lime	1.05-1.15	+/- 700	360	1.140
12 1/4	950	Oil-based	1.45-1.70	+/- 490	210	844

Borehole Section (in)	MD (m)	Mud Type	Specific Gravity (SG)	Mud Volume per Well (m <sup>3</sup> )	Cuttings Volume per Well (m <sup>3</sup> )	Total Cuttings Volume (4 Wells) (m <sup>3</sup> )
8 1/2	1033	Oil-based / Water-based	Oil-based / Water-based	Oil-based / Water-based	Oil-based / Water-based	406
Total:				1.540	Oil-based / Water-based	Oil-based / Water-based

The spacer fluid (CaCl<sub>2</sub> brine) that may be used during the cementing phase is estimated at approximately 20–30 m<sup>3</sup> per well, while the excess cement is estimated at approximately 20 m<sup>3</sup> per well.

### 4.2.3 Management Plan

The management plan for the waste generated from the drilling activities of the Project was developed based on the requirements of §1.2.3. It is noted that management (separate collection, temporary storage) of waste within the boundaries of the Project was selected, aiming to promote the fundamental principles of waste management (§1.2.1).

The method of managing the waste streams that may be generated is presented in the following table.

**Table 3-4: Mapping of the Integrated Waste Management System from Drilling Operations**

EWC Code	Description of EWC	Description of Type of Waste	Waste Stream Management		
			Collection/Temporary Storage within the Project Site	Temporary Storage Equipment within the Project Site	Collection (Transport) / Treatment <sup>22</sup>
01 05 04	Sludges and wastes from water drilling	Sludges (water-based drilling muds)	Separate collection of sludge / Temporary storage within the Project	Mud tanks	Licensed entity for collection, transportation and management
		Drilling cuttings from water-based drilling muds	Separate sludge collection / Temporary storage within the Project	-	Disposal at the seabed
		Separator fluid - spacer	Separate collection of liquid / Temporary storage within the Project *if needed	Metal storage tanks 5-25 m <sup>3</sup>	Licensed entity for collection, transportation, and management
01 05 05*	Sludges and wastes from oil drilling	Sludges (oil-based drilling muds)	Separate collection of sludge / Temporary storage within the Project	Mud tanks	Licensed entity for collection, transportation, and management
		Drilling cuttings from oil-based drilling muds	Separate collection of cuttings / Temporary storage within the Project	Cutting tanks	Licensed entity for collection, transportation, and management

<sup>22</sup> "Treatment": Recovery or disposal operations, including preparation prior to recovery or disposal (Law 4819/2021).

EWC Code	Description of EWC	Description of Type of Waste	Waste Stream Management		
			Collection/Temporary Storage within the Project Site	Temporary Storage Equipment within the Project Site	Collection (Transport) / Treatment <sup>22</sup>
		Spacer fluid	Separate collection of liquid / Temporary storage within the Project, *if needed	Metal storage tanks 5-25 m <sup>3</sup>	Licensed entity for collection, transportation, and management
01 05 06*	Drilling muds and other drilling wastes containing hazardous substances	Sludges (drilling muds containing hazardous substances)	Separate collection of liquid / Temporary storage within the Project, *if needed	Mud tanks	Licensed entity for collection, transportation, and management
		Cuttings from drilling operations containing hazardous substances	Separate collection of liquid / Temporary storage within the Project, *if needed	Cutting tanks	Licensed entity for collection, transportation, and management
		Spacer fluid	Separate collection of liquid / Temporary storage within the Project, *if needed	Metal storage tanks 5-25 m <sup>3</sup>	Licensed entity for collection, transportation, and management
01 05 07	Drilling muds and wastes containing baryte other than those mentioned in entries 01 05 05 and 01 05 06	Water-based drilling muds containing baryte	Separate collection of liquid / Temporary storage within the Project	Mud tanks	Licensed entity for collection, transportation, and management
		Drill cuttings containing baryte from water-based drilling muds	Separate collection of liquid / Temporary storage within the Project	Cutting tanks	Entity responsible for collection and transport or disposal to approved suitable recipients in accordance with the Environmental Terms Approval (AEPO) of the Project.
01 05 08	Muds and drilling wastes containing chlorides other	Muds containing chlorides (water-based drilling fluids)	Separate collection of sludge / Temporary storage within the Project site.	Mud tanks	Licensed entity for collection, transportation, and management



EWC Code	Description of EWC	Description of Type of Waste	Waste Stream Management		
			Collection/Temporary Storage within the Project Site	Temporary Storage Equipment within the Project Site	Collection (Transport) / Treatment <sup>22</sup>
	than those mentioned in 01 05 05 and 01 05 06	Drilling cuttings containing chlorides from water-based drilling fluids	Separate collection of cuttings/ Temporary storage within the Project site.	Cutting tanks	Entity responsible for collection and transport or disposal to approved suitable recipients in accordance with the Environmental Terms Approval (AEPO) of the Project.
		Spacer Fluid	Separate Collection of Liquid / Temporary Storage within the Project Site *if necessary	Metal storage tanks 5-25 m <sup>3</sup>	Licensed entity for collection, transportation, and management
17 01 01	Concrete	Excess Cement Slurry	Separate Collection of Solidified Cement / Temporary Storage within the Project Site <i>if necessary</i>	Metal Storage Container	Reuse on-site or collection and transport entity / Collective Alternative Management System (SEΔ).

It is noted that through the electronic services of the Electronic Waste Registry (HMA), it is possible to search, based on the EWC code(s), for the respective licensed entities for waste collection and transport by regional unit.

### 4.3 WASTE FROM OPERATION / MAINTENANCE OF THE FACILITY

It is estimated that during the operation and maintenance of the underground CO<sub>2</sub> storage facility, both non-hazardous and hazardous waste will be generated.

Given the early stage of the Project study, it is not possible to accurately estimate the types and quantities of hazardous and non-hazardous waste that may be produced. However, it can be mentioned that hazardous waste from existing facilities is generated on the Delta platform. This waste is produced during general maintenance of the facilities, which lasts 15 days every 30 months. The hazardous waste generated from cleaning tanks V-101 A/B, V-107, and V-102 from the water treatment on the Delta platform consists of oily sludge (mixtures of heavy hydrocarbons mainly containing asphaltenes), rags, absorbent materials, etc. Hazardous and non-hazardous waste may arise from the processing of CO<sub>2</sub>.

Indicatively, the categories of waste estimated to be generated from the operation and maintenance of the underground CO<sub>2</sub> storage facility, according to the European Waste Catalogue (EWC), are presented in the following table. It is noted that codes with an asterisk (\*) denote wastes considered hazardous.

**Table 1-14: Indicative types of waste from the operation and maintenance of the underground facility according to the EWC**

EWC Code	Description
<b>13</b>	<b>WASTE OILS AND WASTE FUELS (excluding edible oils and those included in chapters 05, 12, and 19)</b>
<b>13 02</b>	engine, gearbox, and lubrication oils
<b>13 02 05*</b>	non-chlorinated engine, gearbox, and lubrication oils based on minerals
<b>14</b>	<b>WASTES FROM ORGANIC SUBSTANCES USED AS SOLVENTS, REFRIGERANTS, AND PROPELLANTS (excluding chapters 07 and 08)</b>
<b>14 06</b>	wastes from organic substances used as solvents, refrigerants, and foaming/aerosol propellants
<b>14 06 01*</b>	chlorofluorocarbons, HCFC, HFC
<b>14 06 03*</b>	other solvents and mixtures of solvents
<b>15</b>	<b>WASTE FROM PACKAGING; ABSORBENT MATERIALS, WIPING CLOTHS, FILTER MATERIALS, AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED</b>
<b>15 02</b>	absorbent materials, filter materials, wiping fabrics, and protective clothing
<b>15 02 02*</b>	absorbent materials, filter materials (including oil filters not otherwise specified), wiping fabrics, protective clothing that have been contaminated with hazardous substances
<b>16</b>	<b>OTHER WASTES NOT SPECIFIED ELSEWHERE IN THE LIST</b>
<b>16 05</b>	gases in pressure containers and discarded chemical substances
<b>16 05 06*</b>	laboratory chemicals consisting of hazardous substances or containing hazardous substances, including mixtures of laboratory chemicals
<b>16 10</b>	aqueous liquid waste intended for off-site treatment
<b>16 10 01*</b>	aqueous liquid waste containing hazardous substances

EWC Code	Description
16 10 02	aqueous liquid waste other than those included in 16 10 01
17	<b>WASTE FROM CONSTRUCTION AND DEMOLITION</b>
17 04	metals (including their alloys)
17 04 05	iron and steel
17 04 09*	metal waste contaminated with hazardous substances

The management of the above-mentioned hazardous and non-hazardous wastes, as well as any other potentially generated wastes during the operation and maintenance phase of the facility, will be carried out in accordance with the applicable legislation. The generated wastes will be collected separately by type in containers suitable for their safe temporary storage within the Project boundaries, in compliance with safety and environmental protection regulations, and their management will be performed by licensed entities for waste collection, transport, and management.

Hazardous wastes such as rags, absorbent materials, etc., related to this Project and originating from the shared use of the water separation system of the Delta platform, e.g., water separator V-102, are already included in the existing operation of the Delta platform.

#### 4.4 WASTE FROM DECOMMISSIONING – RESTORATION

The management of wastes during the decommissioning and dismantling phase will be conducted according to the applicable legislation. The generated wastes will be collected separately by type in containers suitable for their safe temporary storage within the Project boundaries, in compliance with safety and environmental protection regulations, and their management will be carried out by licensed entities for waste collection, transport, and management.

At the current stage of the Project, it is not possible to estimate the type and quantities of wastes to be generated. Indicatively, the most significant source of waste is the removable equipment, whose management will be carried out appropriately depending on the applied decommissioning method, with the primary priority being reuse, followed by recycling, and finally the safe disposal of materials that cannot be reused or recycled, according to the applicable legislation. Additionally, a waste stream during the shutdown phase derives from the growth of marine organic matter in the support pipelines, the quantities of which will be possible to estimate once the exact time of the Project's shutdown is known. Apart from the above, it is expected that urban waste, packaging waste, Construction and Demolition Waste (C&DW), Waste Electrical and Electronic Equipment (WEEE), oil wastes, etc., will be produced.

## 5 WASTE MANAGEMENT PROCEDURES AND EQUIPMENT

### 5.1 WASTE CLASSIFICATION

The evaluation and classification of wastes are applied to each separate waste stream produced, after obtaining a representative sample. In the case where more than one type of waste exists, each type must be assessed separately. This ensures that any hazardous waste batches or elements:

- are not misclassified as non-hazardous due to mixing (dilution) with other wastes.
- are identified timely to prevent mixing with other wastes, e.g., in containers, bags, piles, or bins.

Only mixed municipal waste originating from households is exempt from these obligations.

Waste classification must be performed according to the instructions contained in the “Commission Notice on technical guidance for the classification of waste C/2018/1447.”<sup>23</sup>.

Briefly, the general waste classification stages are as follows:

**Stage 1: Is the Waste Framework Directive 2008/98/EC (WFD), which has been incorporated into Greek legislation by Law 4819/2021 (Government Gazette 129/A/23.07.2021), applicable?**

- First, it must be confirmed that the substance or object under consideration constitutes waste (as defined by the WFD). Determining whether the substance or object is waste under the WFD is a prerequisite for further hazard assessment. The guidance regarding the WFD provides clarifications on the basic definition of “disposal” within the WFD framework, as well as related concepts of “by-product” and “waste recovery” within the WFD.
- Second, it must be checked whether certain specified waste streams are excluded from the WFD scope. Even if the substance or object is considered waste, it must be evaluated whether any of the exemptions in Article 2 of the WFD apply. The WFD guidance provides detailed clarifications on selected exemptions. If an exemption applies, neither the WFD nor the waste list applies (an exceptional case is the mining waste directive, which is outside the WFD scope but requires classification according to the waste list if conditions apply).

All waste streams not explicitly excluded from the WFD scope must be classified according to the WFD and the waste list, following the approach outlined in the technical guidance note. This obligation also applies when additional legislation exists for a given waste stream, as referenced in Article 2(4) of the WFD.

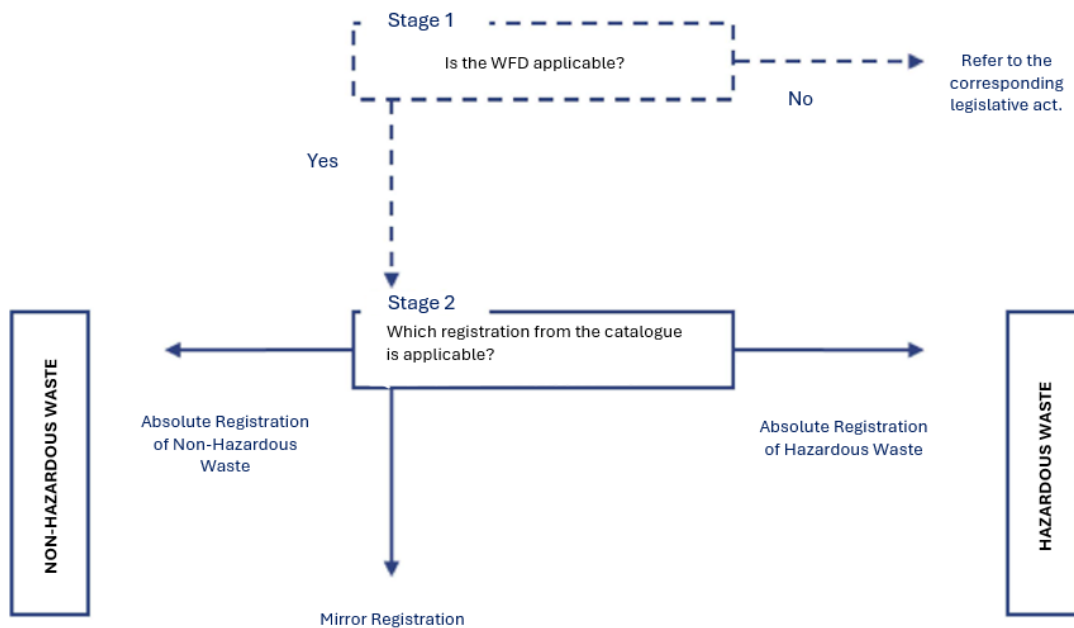
**Stage 2: Which entry in the waste list (2000/532/EC (L 226), as amended) is applicable?**

Upon completing the first two stages, the following should be known:

- whether the substance or object falls under the WFD and the waste list, and

<sup>23</sup> <https://eur-lex.europa.eu/legal-content/EL/ALL/?uri=CELEX%3A52018XC0409%2801%29>

- whether an “absolute” classification (Absolute Hazardous - AH or Absolute Non-Hazardous - ANH) or a “mirror” classification (Mirror Hazardous - MH or Mirror Non-Hazardous - MNH) applies, and consequently, whether further assessment (Stages 3 to 5) is required.



**Stage 3: Are sufficient data available regarding the composition of the waste to determine whether it exhibits hazardous properties, either through calculation or testing as described in Stage 4.**

Collecting adequate information on the presence and content of hazardous substances in the waste in order to determine whether the waste may exhibit one or more of the hazardous properties HP1 to HP15 is an essential stage of waste classification. Certain information on the composition of the waste is required regardless of the method used to assess the hazardous properties (calculation or testing), as described in Stage 4. There are several ways to obtain information on the relevant composition of the waste, the hazardous substances potentially present, and the hazardous properties that may arise:

- Information on the production process/physical or chemical process generating the waste and on related input substances and intermediates, including expert judgement (useful sources may include BREFs, industry handbooks, process descriptions, and lists of input materials issued by the producer, etc.),
- Information from the original producer of the substance or object before it became waste, e.g. safety data sheets (SDS), labels, or product sheets (Annex 2 of the Guidance),
- Waste analysis databases at Member State level,
- Sampling and chemical analysis of the waste (see Annex 4 of the C/2018/1447 guidance).

Once information on the composition of the waste is collected, it becomes possible to assess whether the identified substances are classified as hazardous, i.e., whether they must be assigned hazard statements according to the criteria set out in the CLP Regulation.

#### **CLP<sup>24</sup> Regulation on Classification, Labelling and Packaging**

*The CLP Regulation sets out the criteria for the classification of substances and mixtures for hazardous properties. According to the CLP Regulation, waste is not considered a substance, mixture, or article. Nevertheless, the hazardous properties applied to waste are linked to the criteria in the CLP Regulation. Moreover, the classification of substances under CLP may be useful for the classification of waste.*

*Although Annex III of the WFD is based on the CLP Regulation, the criteria set out in the CLP Regulation have not been fully incorporated on a one-to-one basis. Instead, for waste classification purposes, it should be noted that some HP criteria in Annex III of the WFD refer directly to the hazard classes and categories under CLP, as well as to hazard statements and their associated classification criteria. Many mirror entries refer specifically to "hazardous substances." Substance classification is carried out in accordance with CLP, while the presence of hazardous substances in the waste must be assessed based on Annex III of the WFD (for further information, see Annex 3 of the Guidance). Furthermore, Table 3.1 of Part 3 of Annex VI of the CLP Regulation provides a set of official harmonised classifications of substances. Where such harmonised classification is available, it must be used in the classification of waste (for information on this, see Annex 2 of C/2018/1447).*

#### **Stage 4: Does the waste exhibit any of the hazardous properties HP1 to HP15<sup>25</sup>?**

Annex 3 of C/2018/1447 and Annex III of the WFD describe the 15 properties (HP1 to HP15) that render waste hazardous.

By the end of Stage 3, sufficient information should exist regarding the relevant composition of the waste under consideration. This means that the hazardous substances present in the waste and their classification (e.g. whether they correspond to relevant hazard statement codes under the CLP Regulation) should be known to a sufficient degree to allow application of at least one of the following methods to determine whether the waste exhibits hazardous properties:

- **Calculation:** if the amount of hazardous substances in the waste equals or exceeds the threshold values based on hazard statement codes (individually, depending on properties HP4 to HP14 – see Annex 3 of C/2018/1447),
- **Testing:** to determine whether the waste exhibits hazardous properties or not.

Annex 3 of C/2018/1447 provides detailed descriptions and guidance on how to assess each of the hazardous properties HP1 to HP15 via calculation or testing.

<sup>24</sup> Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

<sup>25</sup> The 15 properties (HP1 to HP15) of waste that render it hazardous, as set out in Annex III of the Waste Framework Directive (WFD) and Annex III of Law 4819/2021.

With regard to the calculation method, it should be noted that the content values of hazardous substances in the waste, as determined, e.g. by sampling and chemical analysis, must be compared to the concentration limits listed in Annex III of the WFD. Furthermore, it must be explicitly stated that according to Article 7(4) of the WFD, dilution or mixing of the waste in order to reduce the initial concentration of hazardous substances is not permitted. It is also noted that the concentration limits in Annex III of the WFD do not apply to pure metal alloys in solid form, provided they are not contaminated with hazardous substances. Further information on metal alloy classification is available in Annex 1, section 1.4.6 of C/2018/1447.

Further guidance on waste sampling and chemical analyses for the purpose of applying the calculation method is provided in Annex 4 of C/2018/1447.

**Direct testing:** *In certain cases, it may be useful to determine whether the waste exhibits a specific hazardous property (e.g., physical properties such as HP1 “Explosive,” HP2 “Oxidising,” or HP3 “Flammable”).*

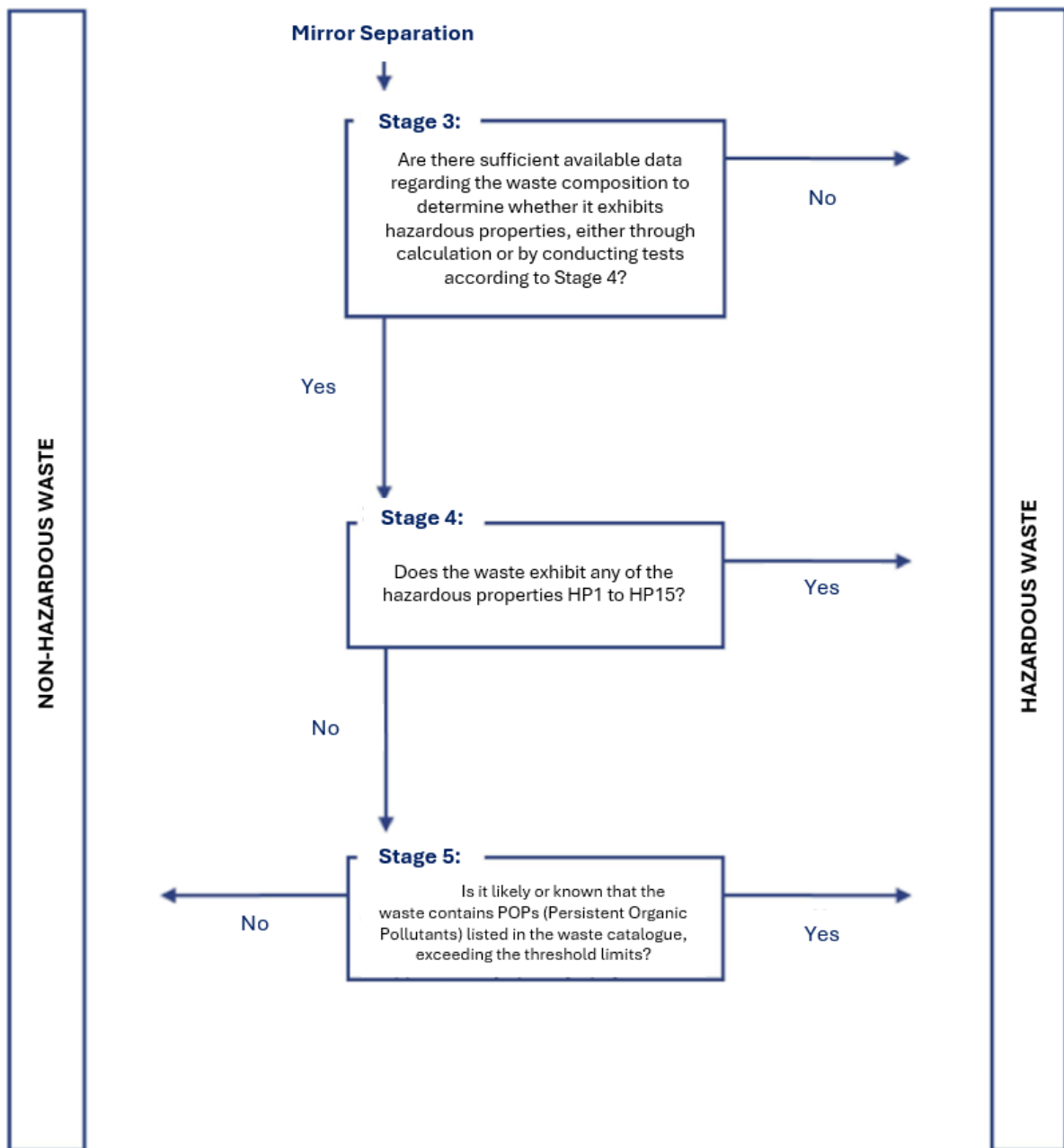
*According to the Waste List Annex, “Where a hazardous property of the waste has been assessed both by testing and by using the concentrations of hazardous substances set out in Annex III of Directive 2008/98/EC, the test results shall prevail.”.*

Finally, if the waste exhibits one or more of the 15 hazardous properties, it must be assigned the relevant MH (Mirror Hazardous) entry. If, on the other hand, it does not exhibit any hazardous properties, then Stage 5 must be carried out to assess whether the waste contains certain specific POPs in quantities above the relevant thresholds. This is the final stage before a decision can be made to assign the MH or MNH (Mirror Non-Hazardous) entry to the waste under consideration.

#### **Stage 5: Is it likely or known that the waste contains POPs listed in the Waste List Annex?**

*Stages 3, 4, and 5 must be used when selecting the appropriate mirror entry. Moreover, these sections may also be used to identify hazardous properties of waste related to AH (Absolute Hazardous) entries, as such information may be required to ensure compliance with the provisions set out in Article 19 of the WFD (Article 45 of Law 4819/2021) regarding proper labelling of hazardous waste (e.g., for completing waste transfer tracking forms).*

*Upon completion of Stages 3 to 5, it should be finally determined whether the waste under consideration contains hazardous components and whether it exhibits one or more hazardous properties (HP1 to HP15), and/or whether it contains relevant POPs. Subsequently, a decision can be made on whether the waste is hazardous or non-hazardous.*



## 5.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

During waste handling, appropriate safety measures shall be taken. Personnel involved in waste management shall be fully equipped with appropriate Personal Protective Equipment (PPE). The aforementioned equipment includes:

- Work overalls.
- Protective goggles.
- Gloves:
  - Rubber gloves shall be worn when handling hazardous waste.



- Safety gloves shall be worn when handling non-hazardous waste.
- Mask:
  - A biological mask shall be used when dealing with hazardous waste (solid and liquid).
  - A dust mask shall be used when dealing with non-hazardous waste.
- Safety boots (steel-toed).
- Safety helmet.

### 5.3 TEMPORARY WASTE STORAGE

Temporary waste storage areas shall cover sufficient surface area, taking into account the requirements of the Project, as well as the number and size of the containers.

The temporary waste storage areas shall be located within the Project site, and access shall be provided for waste removal.

Space must be provided for filling and emptying containers, as well as for equipment washing and the collection of contaminated water. Sufficient spacing shall be maintained between containers to allow for proper visual inspection and to facilitate emergency access.

Areas where waste from drilling activities is collected must have an impermeable floor (concrete base, compacted subsoil, or embankment above a concrete base to allow for the removal of potentially contaminated soil) and a washing and drainage system suitable for handling contaminated effluents.

All waste management areas must be appropriately marked and signposted.

The accumulation period for hazardous and non-hazardous waste shall be kept to a minimum, thereby reducing the risks associated with the storage of large quantities of waste, particularly hazardous waste.

Containers used for waste storage must be in good condition, free of visible defects that could lead to leaks or spills, clearly labelled with their contents and any associated hazards, and made of materials compatible with the type of waste they contain. For the temporary storage of extractive waste pending collection, only covered metal skips and closed tanks shall be used.

All waste shall be removed from the site during the Preliminary Decommissioning Phase of the Project.

### 5.4 WASTE TRANSPORTATION

Waste transportation shall be carried out by waste collection and transport entities registered in the National Waste Registry (HMA). Specifically for hazardous waste, collection, transportation, storage, and treatment shall be conducted by licensed operators.

All waste transfers shall be accompanied by the relevant transport documents, which shall be completed by the waste collection and transport operator, with a copy retained by the Project Operator.

## 5.5 INSPECTION AND CONTROL

The Project Operator shall carry out checks and inspections as part of daily operations to ensure that all collection and temporary storage equipment and facilities remain in good condition, and that the procedures of the present Waste Management Plan (WMP) are followed.

The Project Operator shall carry out inspections to ensure compliance with the WMP, including but not limited to the following:

- Practical implementation of the WMP.
- Implementation of the procedures outlined in the WMP.
- Annual recording of hazardous and non-hazardous waste.
- Annual reporting of hazardous and non-hazardous waste in the HMA.
- Waste transport documentation.

In the event of findings or instances of non-compliance, the necessary corrective measures shall be taken.

## 5.6 ANNUAL WASTE GENERATION REPORT

Each year, an annual review and update of the WMP shall be carried out as needed by the Project Operator, who shall submit to the Electronic Waste Registry (HMA) of the Ministry of Environment and Energy (YPEN) annual data and information on the generation and management of all types of waste covered by the EWC (in particular, and as applicable, the producer, the type of waste (EWC code), the quantity, the waste management facility, and the disposal or recovery operations), in accordance with Article 53 of Law 4819/2021.

## 6 MONITORING OF PLAN IMPLEMENTATION

The present Waste Management Plan (WMP) constitutes the guiding plan for the implementation and execution of the Project's integrated waste management system. It serves as a reference document, as it sets out the directions for integrated waste management, the actions to be implemented, and the objectives to be met.

Within the framework of monitoring and evaluating the WMP, continuous improvement and adaptation of the plan to new data is recommended, by implementing the necessary modifications or updates as needed. The form and frequency of monitoring shall be determined as the project progresses.

Monitoring the achievement of the WMP objectives shall be carried out through the collection of data from the waste management system. The data shall include both quantitative and qualitative characteristics in order to enable a detailed monitoring of results. The data collected by the respective waste collection, transport, and management operators shall consist, indicatively and not exhaustively, of:

- the quantities of collected waste,
- the qualitative analysis of generated and collected waste,
- financial data and related analyses (e.g. cost per person, cost per tonne),
- the number and type of awareness-raising actions.

The evaluation of the achievement of the WMP objectives is proposed to be carried out, indicatively, through the monitoring of the following indicators:

- reduction of total waste generation,
- diversion rate from landfill (reduction of waste quantities sent to landfill),
- increase in the amount of waste collected by alternative waste management systems,
- reduction in the quantity of waste collected that does not fall under alternative waste management systems,
- reduction of contamination in recyclable materials.

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