MINERA DE SANTA MARTA, S.A.

Grupo SAMCA

EPD®

THE INTERNATIONAL EPD® SYSTEM

ENVIRONMENTAL PRODUCT DECLARATION OF STANDARD SODIUM SULPHATE AND COLORED SODIUM SULPHATE MINERA SANTA MARTA S.A.

In accordance to ISO 14025 and PCR 2011:18, v2.12

Registration number: S-P-02908

Program operator: EPD International AB

www.environdec.com

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Geographical scope: Global

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com.
In accordance to ISO 14025

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1. PROGRAM INFORMATION.

This Environmental Program Declaration (EPD) is developed in accordance with the Product Category Rules (PCR) from the Programme:

- Programme holder: The International EPD® System
  Operator programme: EPD International AB.
- Operator programme address: EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden, E-mail: info@environdec.com
- The EPD owner is solely responsible for the EPD (the EPD owner has the sole ownership, liability and responsibility of the EPD).
- The verifier and the program operator do not express any opinion nor are they responsible for the legality of the product.
- EPDs within the same product category but from different programmes may not be comparable.
- Procedure for follow-up of data during EPD validity does not involve third party verifier.

2. VERIFICATION.

Product category rules (PCR):	PCR 2011:18 Basic inorganic chemicals not elsewhere classified, version 2.12. Date: 2020-05-28. Valid until: 2021-03-01
PCR review was conducted by:	The Technical Committee of the International EPD® System. Chair: Lars-Gunnar Lindfors Contact via info@environdec.com
Standards conformance:	General Programme Instruction of the International EPD® System, version 3.01, based on ISO 14025 and ISO 14040/14044. PCR Basic Module, CPC Division 34 Basic chemicals, version 3.01, dated 2018-11-06.
Independent verification of the declaration and data, according to ISO 14025	☐EPD process certification ☒EPD verification
Third party verifier:	Tecnalia R&I Certificación S.L. Auditor: Cristina Gazulla Santos
Accredited or approved by:	Accredited by: ENAC. Accreditation no.125/C-PR283
Procedure for follow-up of data during EPD validity involves third party verifier:	☒Yes ☐No

- Geographical scope of the EPD: global.
- Reference year of the data used in the EPD: 2019.
- Useful Web Sites Reference for more information:
  https://www.environdec.com;
  https://minerasantamarta.com/

3. INFORMATION OF THE EPD OWNER.

MSM
MINERA DE SANTA MARTA, S.A.

- Company name: Minera Santa Marta, S.A.
- Issuer and contact details:
  D. José Antonio García Anquela.
  Address: Paseo Independencia, 21 - 3º, 50001 Zaragoza (Spain)
  Phone: +34 976 216 129 · Fax: + 34 901 020 266
  https://minerasantamarta.com/
- Production Centers:
  Ctra. Briviesca-Belorado, km 19,5, 09250 Belorado, Burgos (Spain).
  Ctra. CM-322, km 7,2, 45360 Villarrubia de Santiago, Toledo (Spain).
- Production country: Spain

MINERA DE SANTA MARTA, S.A. is a Spanish leading company in the production and commercialization of natural anhydrous sodium sulphate. Currently MSM has 2 production plants located in the provinces of Burgos and Toledo.

MSM is part of **SAMCA**, an industrial and mining Group, and it has a consolidated and widespread presence both in national and international markets, with sales in all continents.

The minerals used for the production of MSM's anhydrous sodium sulphate are glauberite and thenardite.

MSM´s production process counts with the most advanced technology, completely respectful with the environmental standards. It allows to obtain extremely dry products of the highest purity in Na_2SO_4 content, with an absence of alkalineearth metals and heavy metals. MSM's products have a wide range of mean particle sizes ranging from single crystals of 160 µm to 750 µm.

The sodium sulphate produced by **MSM** is perfectly suited to different consumer sectors: manufacturers of detergent powder with dissolution and dry mixing or after addition processes, dishwasher powder products, glass manufacturing, paper pulp and Kraft paste, textile coloring processes, industrial dyes, animal feed, pharmacy, etc.

In the development of new products of sodium sulphate **MSM** is considered as one of the best companies worldwide, being a pioneer in topics of high granulometry, in colored products, specialties and in the additive of products on sodium sulphate.

MSM is a company committed to Quality and the Environment, certified under ISO 9001 since 1996 and under ISO 14001 since 2019. In line with this commitment, and thanks to strict Quality Controls,

MSM is registered in the Registers of the European Union for the realization of the manufacturing and marketing activity of raw materials for animal feed, and also registered with the U.S. Food and Drug Administration (FDA) for these uses.

MSM, in line with its environmental commitment, develops its activities taking into account the principles of sustainability and circular economy, minimizing the generation of waste and discharges in its manufacturing process, as well as optimizing water and energy consumption. This allows the company to overall reduction of the Carbon Footprint at both the product and organizational level.

MSM also performs the restoration of all mining fronts using the best available techniques, allowing the landscape integration of the land affected by mining works, the regeneration of soils by providing plant soil and the implementation of a plant cover suitable to the conditions of the environment from the planting of native species. The goal is to return to the original owners, for previously established uses and services, the land used on mining farms.

4. INFORMATION OF THE LIFE CYCLE ANALYSIS AND EPD AUTHOR.

The study of Life Cycle Analysis and the Environmental Product Declaration have been prepared by the company Abaleo S.L.

- Contact information: José Luis Canga Cabañes; +34 639 901 043; jlcanga@abaleo.es; info@abaleo.es

5. PRODUCT INFORMATION.

5.1. Product specification.

- Trade name: standard sodium sulphate and colored sodium sulphate.
- This EPD includes the production of MSM sodium sulphate by analyzing the product in its two shipping formats including packaging: standard bulk sodium sulphate, packaged and palletized standard sodium sulphate, and packaged and palletized colored sodium sulphate.
- CPC code: 3423.
- The intended use of sodium sulphate is consumer sectors of this product (manufacturers of detergent, glass, pulp paper, textile and industrial coloring, food, pharmacy, etc.)
- Product description:

Chemical name	Anhydrous sodium sulphate
Chemical formulation	Na_2SO_4
Molecular weight	142,04
CAS Register Nº	7757-82-6
EINECS Nº	231-820-9

5.2. Physical and chemical properties of the product.

Appearance (physical state)	Solid
Format	Dust
Color	White or colored
Smell	Without smell
pH in aqueous solution	8 to 20 °C, 10% solution
Melting point	884°C
Boiling point	1429°C (under 1013 hPa)
Flash point	Not applicable
Explosive properties	Non-explosive, in accordance with EEC criteria
Oxidizing properties	Non-oxidizing, according to EEC criteria
Decomposition temperature	1200°C
Relative density	2,66 (d 20/4) g/cm^3 (20°C)
Apparent density	1,3 – 1,65 Kg/dm^3 (product without compacting)
Solubility in water	161 g/l a 20°C
Solubility in alcohol (ethanol)	Insoluble
Solubility in glycol	Insoluble
Distribution coefficient n-octanol/water	Log K_{ow} = -3 to 20°C
Hygroporosity	Very hygroscopic product

The product is not considered toxic or harmful: DL_{50} oral (flat): 10.000 mg/kg.

No hazardous substances listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorisation" by a percentage greater than 0.1% of the weight of the product.

5.3. Declared unit.

The declared unit is 1.000 kg of sodium sulphate, including the corresponding part of the packaging. The product is presented in two different formats: standard sodium sulphate and colored sodium sulphate.

5.4. Units and quantities.

The units used are those required by the PCR. Decimals are indicated by commas, in the SI style (French version); for example, 2.156,234.

6. EPD SCOPE.

6.1. EPD geographical scope.

The geographical scope of EPD is global. It is valid for the sale, anywhere in the world, of all the product manufactured in the **MSM** facilities, of the plants located in Belorado (Burgos) and Villarrubia de Santiago (Toledo), in Spain.

6.2. EPD comparision within this product category.

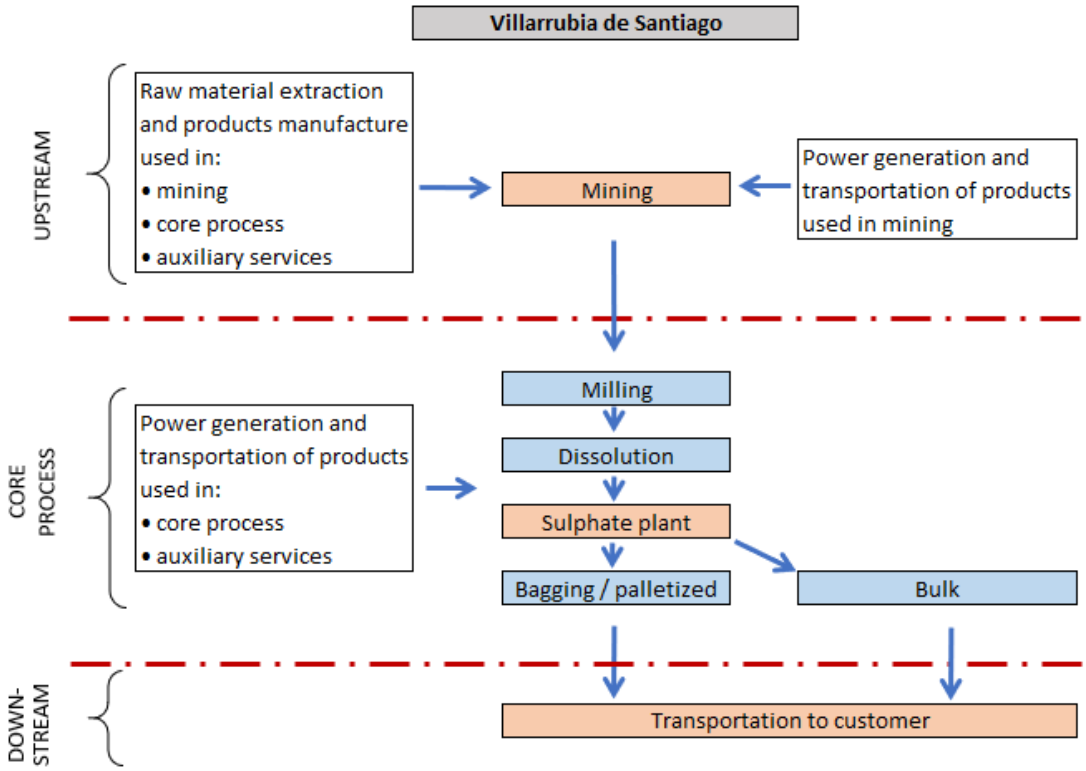
EPDs from other similar products of different programs may not be comparable.

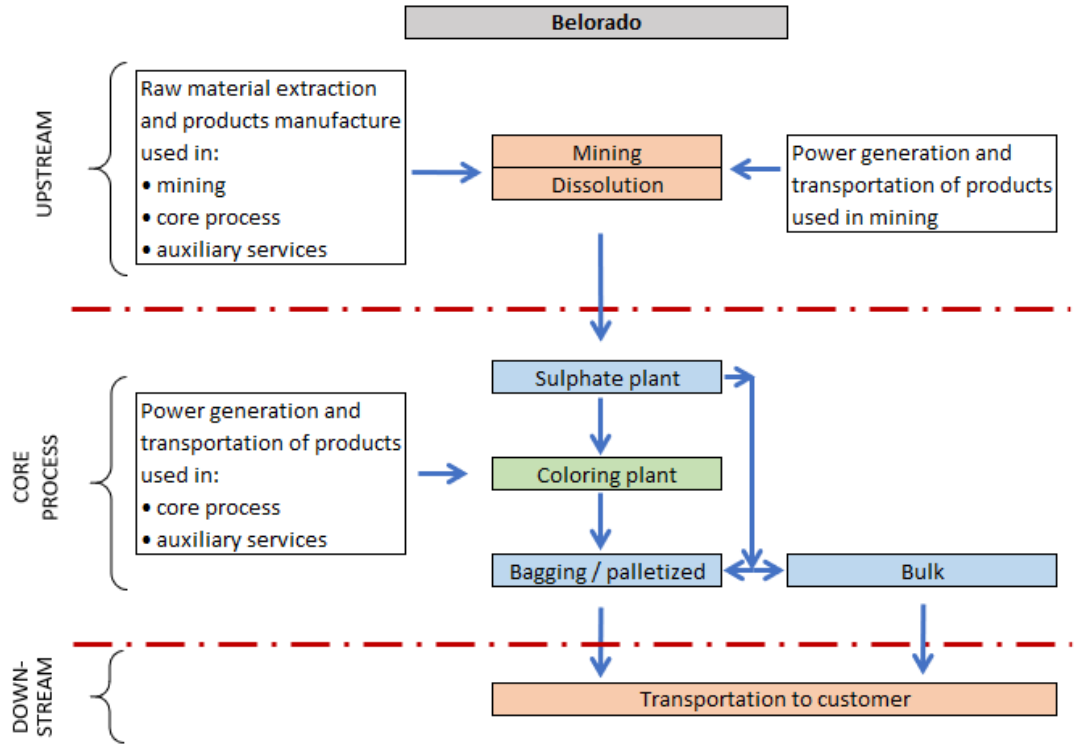
The results presented in this document do not constitute comparative statements. However, the results will be disclosed to the public in the form of EPD, which may be used to compare **MSM** products with similar products presented in other EPDs that follow the same PCR.

7. LIFE CYCLE ANALYSIS INFORMATION.

7.1. Process diagram of the system boundaries studied in this EPD.

All phases of the life cycle have been studied, from the cradle to the customer's door. The limits of the system studied in the Life Cycle Analysis of sodium sulphate production are shown below, for the Belorado and Villarrubia de Santiago plants, which have some differences:





7.2. Lyfe Cycle Análisis scope.

This cradle-to-gate EPD covers from the cradle to the **MSM** customer door (cradle to gate). Subsequent processes of standard sodium sulphate and colored sodium sulphate are beyond the scope of this EPD. The Upstream, Core Process and Downstream stages of sulphate production have been studied:

- Upstream, includes all the necessary processes to:
  - The extraction of the materials.
  - Refining, processing, and storing resources.
  - The production of the energy used in upstream processes.
  - Production of all materials used in upstream processes.
  - Transport to the plant of the products used in the upstream phase.
  - All contributions to the upstream phase from the auxiliary services of the plants (steam boiler, cooling towers, water treatment plant, cogeneration plant) and general services (offices, workshop, laboratory).
  - Water consumption.
  - All emissions from upstream process.
  - Treatment of waste generated by all upstream processes.
  - Production of primary and secondary packaging.
- Core Process, consider:
  - All material and energy inputs to the core process, including electricity, fuel and steam.

  - The production processes of the energy used in the core process.
  - All emissions from the sulphate production process.
  - Transport and treatment of waste generated in core process.
- Downstream, considers only the transportation of sodium sulphate from the MSM plants in Belorado and Villarrubia de Santiago to customers, applying the default criterion that the transport distance is 1,000 km by road.

The LCA has studied more than 99% by weight of the materials used in standard and colored sodium sulphate production.

The packaging considered in the studio are the big-bags and pallets used in the distribution of the product.

The LCA has not consider:

- Production of the biocide used in the cooling towers, nor of the antifouling of the treatment plant in Villarrubia de Santiago plant.
- Production of alumina balls used in the dissolution stage in Villarrubia de Santiago plant.
- All equipment whose useful life is longer than 3 years.
- Construction of the buildings of the plant, nor other capital goods.
- Staff work trips; or staff travels to work or from work.

Two principles have been followed in the LCA: the polluter pays principle and the modularity principle (environmental charges are assigned to the stage where the impact occurs).

This EPD only covers the cradle to customer gate stages because all the other stages are highly dependent on particular scenarios and is eassier to associate their development to specific product.

7.3. Data reference year.

The collected data for this EPD cover one year, 2019, a period with representative production data for the two plants: Belorado (Burgos) and Villarrubia de Santiago (Toledo). The electricity mix of the supply company for 2019, already available at the time of elaborating this EPD, has been used for the electrical power production (composition shown in the annex).

7.4. Cut-off criteria.

As a rule, according to the PCR criteria, the LCA has included the gross weight/volume of all materials used in the manufacturing process so that at least 99% of the weight of the product unit is obtained.

The production of the biocide used in the cooling system (which represents 0,0001% of the total volume of chilled water), nor that used in the treatment plant as antifouling (which represents 0,005% of the total volume of water treated in the plant) has not been considered in Villarrubia de Santiago plant. The production of the alumina balls used in this same plant in the dissolution stage, which represent less than 0.000001% by weight of production, has not been considered in this plant either.

7.5. Allocation.

According to the RCP, the criteria for assigning the environmental impacts to the co-products of the multi-output unit processes, within the main process, have been the assignment of the inputs and outputs of the system based on mass of the products.

This allocation criterion has been applied for the general consumption of the plant (general services, auxiliary services, cooling system, steam boilers, water treatment plant and cogeneration plant) and for waste. It has not been necessary to apply other allocation criteria, such as economic allocation.

7.6. Data quality.

The EPD data meet the quality requirements set out in the PCR. To assess the quality of the primary data used, a semi-quantitative data quality assessment criterion has been applied, as it is proposed by the European Union in its Product and Organisation Environmental Footprint Guide (OEF). The results obtained are shown below:

- Integrity – very good. 1 point.
- Methodological appropriateness and consistency (M) - good. 2 points.
- Time-related representativeness (TiR) – very good. 1 point.
- Technological representativeness (TeR) –good. 2 point.
- Geographical representativeness (GR) – very good. 1 point.
- Parameter uncertainty (P) - good. 2 point.

In accordance with this evaluation, the Data Quality Rating (DQR) of the dataset is: 9/6= 1,5, corresponding to an overall “excellent quality”.

The quality rating is based on scoring from 1 to 5 each of the six criteria (lower punctuation means the best quality); and the final overall is obtained according to the following table:

Overall data quality level according to the achieved data quality rating

Overall data quality rating (DQR)	Overall data quality level
≤ 1.6	"Excellent quality"
>1.6 to≤ 2.0	"Very good quality"
>2.0 to ≤3.0[71]	"Good quality"
>3 to ≤4.0	"Fair quality"
>4	"Poor quality"

8. ENVIRONMENTAL INFORMATION.

8.1. Environmental impacts.

Below are the results obtained for standard sodium sulphate and colored sodium sulphate in the environmental impact categories that PCR requests in all three stages of the life cycle.

Potential environmental impacts - 1,000 kg of standard sodium sulphate					
Parameter	**Unit**	**Upstream**	**Core Process**	**Downstream**	**Total**
GWP - fossil	kg CO_2 eq.	53,87	105,51	138,15	297,54
GWP - biogenic	kg CO_2 eq.	3,86E-02	4,57E-01	8,64E-03	5,04E-01
GWP - luluc	kg CO_2 eq.	1,49E-02	1,18E-01	1,09E-03	1,34E-01
GWP - TOTAL	kg CO_2 eq.	53,93	106,09	138,16	298,18
AP	kg SO_2 eq.	1,42E-01	1,94E-01	3,67E-01	7,03E-01
EP	kg PO_4^{3-} eq.	2,49E-02	2,47E-02	6,31E-02	1,13E-01
POCP	kg C_2H_4 eq	9,03E-03	8,86E-03	1,35E-02	3,14E-02
POFP	kg NMVOC eq	1,79E-01	1,35E-01	4,61E-01	7,75E-01
ADPE	Kg Sb eq	1,28E-04	1,15E-05	8,15E-06	1,48E-04
ADPF	MJ, p.c. neto	1.958,67	559,45	1.952,59	4.470,70
WSF	m3	183,51	18,71	-2,94E-01	201,93

GWP - fossil: Global warming potential - fossil; **GWP - biogenic**: Global warming potential - biogenic; **GWP - luluc**: Global warming potential for land use and land transformation; **GWP - total**: Global warming potential; **AP**: Acidification potential; **EP**: Eutrophication potential; **POCP**: Formation potential of tropospheric ozone; **POFP**: Photochemical oxidant formation potential; **ADPE**: Abiotic depletion potential - elementos (ADP-elements); **APDF**: Abiotic depletion potential - fossil fuels (ADP-fossil); **WSF**: Water scarcity potential.

Potential environmental impacts - 1,000 kg of colored sodium sulphate					
Parameter	**Unit**	**Upstream**	**Core Process**	**Downstream**	**Total**
GWP - fossil	kg CO_2 eq.	114,73	204,13	138,15	457,01
GWP - biogenic	kg CO_2 eq.	2,33E-01	3,00	8,64E-03	3,24
GWP - luluc	kg CO_2 eq.	2,21E-02	1,46E-01	1,09E-03	1,70E-01
GWP - TOTAL	kg CO_2 eq.	114,99	207,27	138,16	460,42
AP	kg SO_2 eq.	3,45E-01	2,47E-01	3,67E-01	9,60E-01

Potential environmental impacts - 1,000 kg of colored sodium sulphate					
Parameter	**Unit**	**Upstream**	**Core Process**	**Downstream**	**Total**
EP	kg PO_4^{3-} eq.	5,39E-02	3,38E-02	6,31E-02	1,51E-01
POCP	kg C_2H_4 eq	1,94E-02	1,17E-02	1,35E-02	4,47E-02
POFP	kg NMVOC eq	3,47E-01	1,75E-01	4,61E-01	9,83E-01
ADPE	Kg Sb eq	1,55E-03	1,44E-05	8,15E-06	1,57E-03
ADPF	MJ, p.c. neto	3.974,61	725,88	1.952,59	6.653,07
WSF	m3	339,85	25,61	-2,94E-01	365,17

GWP - fossil: Global warming potential - fossil; **GWP - biogenic**: Global warming potential - biogenic; **GWP - luluc**: Global warming potential for land use and land transformation; **GWP - total**: Global warming potential; **AP**: Acidification potential; **EP**: Eutrophication potential; **POCP**: Formation potential of tropospheric ozone; **POFP**: Photochemical oxidant formation potential; **ADPE**: Abiotic depletion potential - elementos (ADP-elements); **APDF**: Abiotic depletion potential - fossil fuels (ADP-fossil); **WSF**: Water scarcity potential.

Estimated impact results are relative and do not indicate the final value of the impact categories, or refer to thresholds, safety margins or risks.

8.2. Resource use.

The consumption of natural resources and other resources used per functional unit are presented for upstream, core process and downstream.

Resource use - 1.000 kg of standard sodium sulphate					
Parameter	**Unit**	**Upstream**	**Core Process**	**Downstream**	**Total**
PERE	MJ, net calorific value	72,03	410,92	2,74	485,69
PERM	MJ, net calorific value	0,00	0,00	0,00	0,00
PERT	MJ, net calorific value	72,03	410,92	2,74	485,69
PENRE	MJ, net calorific value	1.998,17	1.174,69	1.956,84	5.129,70
PENRM	MJ, net calorific value	0,00	0,00	0,00	0,00
PENRT	MJ, net calorific value	1.998,17	1.174,69	1.956,84	5.129,70
SM	kg	0,00	0,00	0,00	0,00
RSF	MJ, net calorific value	0,00	0,00	0,00	0,00
NRSF	MJ, net calorific value	0,00	0,00	0,00	0,00
FW	m^3	2,31	2,59E-01	9,72E-02	2,67

PERE: Renewable primary energy resources used as energy carrier; **PERM**: Renewable primary energy resources used as raw materials; **PERT**: Total Renewable primary energy resources; **PENRE**: Non-renewable primary energy resources used as energy carrier; **PENRM**: Non- renewable primary energy resources used as raw materials; **PENRT**: Total non- renewable primary energy resources; **SM**: Secondary material; **RSF**: Renewable secondary fuels; **NRSF**: Non-renewable secondary fuels; **FW**: Net use of fresh water.

Resource use - 1.000 kg of colored sodium sulphate					
Parameter	**Unit**	**Upstream**	**Core Process**	**Downstream**	**Total**
PERE	MJ, net calorific value	84,49	511,42	2,74	598,64
PERM	MJ, net calorific value	0,00	0,00	0,00	0,00
PERT	MJ, net calorific value	84,49	511,42	2,74	598,64

Resource use - 1.000 kg of colored sodium sulphate					
Parameter	**Unit**	**Upstream**	**Core Process**	**Downstream**	**Total**
PENRE	MJ, net calorific value	4.034,77	1.491,56	1.956,84	7.483,17
PENRM	MJ, net calorific value	0,00	0,00	0,00	0,00
PENRT	MJ, net calorific value	4.034,77	1.491,56	1.956,84	7.483,17
SM	kg	0,00	0,00	0,00	0,00
RSF	MJ, net calorific value	0,00	0,00	0,00	0,00
NRSF	MJ, net calorific value	0,00	0,00	0,00	0,00
FW	m^3	4,47	3,24E-01	9,72E-02	4,89

PERE: Renewable primary energy resources used as energy carrier; **PERM**: Renewable primary energy resources used as raw materials; **PERT**: Total Renewable primary energy resources; **PENRE**: Non-renewable primary energy resources used as energy carrier; **PENRM**: Non- renewable primary energy resources used as raw materials; **PENRT**: Total non- renewable primary energy resources; **SM**: Secondary material; **RSF**: Renewable secondary fuels; **NRSF**: Non-renewable secondary fuels; **FW**: Net use of fresh water

8.3. Waste production and output flows

The amount of waste generated in the production of the two types of sodium sulphate produced in MSM is shown below, obtained using the EDIP 2003 V1.07 method:

Waste generated during the manufacturing stage - 1.000 kg of standard sodium sulphate					
Parameter	**Unit**	**Upstream**	**Core Process**	**Downstream**	**Total**
Hazardous waste disposed	kg	2,68E-03	5,49E-04	5,18E-03	8,41E-03
Non-hazardous waste disposed	kg	3,92E-01	1,08	1,04E-01	1,58
Radioactive waste disposed	kg	2,83E-03	9,02E-03	1,42E-02	2,60E-02

Waste generated during the manufacturing stage - 1.000 kg of colored sodium sulphate					
Parameter	**Unit**	**Upstream**	**Core Process**	**Downstream**	**Total**
Hazardous waste disposed	kg	5,72E-03	7,65E-04	5,18E-03	1,17E-02
Non-hazardous waste disposed	kg	2,72	4,70	1,04E-01	7,53
Radioactive waste disposed	kg	4,82E-03	1,14E-02	1,42E-02	3,04E-02

The output flows indicators to produce both types of sodium sulphate are:

Output flows - 1.000 kg of standard sodium sulphate					
Parameter	**Unit**	**Upstream**	**Core Process**	**Downstream**	**Total**
Components for re-use	kg	0,00	0,00	0,00	0,00
Materials for recycling	kg	0,00	0,00	0,00	0,00
Materials for energy recovery	kg	0,00	0,00	0,00	0,00
Exported energy, electricity	MJ	0,00	0,00	0,00	0,00
Exported energy, thermal	MJ	0,00	0,00	0,00	0,00

Output flows - 1.000 kg of colored sodium sulphate					
Parameter	**Unit**	**Upstream**	**Core Process**	**Downstream**	**Total**
Components for re-use	kg	0,00	0,00	0,00	0,00
Materials for recycling	kg	0,00	0,00	0,00	0,00
Materials for energy recovery	kg	0,00	0,00	0,00	0,00
Exported energy, electricity	MJ	0,00	0,00	0,00	0,00
Exported energy, thermal	MJ	0,00	0,00	0,00	0,00

8.4. Other environmental indicators.

Below are the values for toxic emissions, obtained by applying the EF 3.0 Method (adapted) V1.00 / EF 3.0 normalization and weighting set methodology:

Human toxicity and ecotoxicity - 1.000 kg of standard sodium sulphate					
Parameter	**Unit**	**Upstream**	**Core Process**	**Downstream**	**Total**
Human toxicity, non-cancer	CTUh	2,05E-07	3,73E-07	1,30E-06	1,88E-06
Human toxicity, cancer	CTUh	1,31E-08	1,08E-08	1,11E-08	3,50E-08
Ecotoxicity, freshwater	CTUe	313,99	659,69	784,98	1.758,66

Human toxicity and ecotoxicity - 1.000 kg of colored sodium sulphate					
Parameter	**Unit**	**Upstream**	**Core Process**	**Downstream**	**Total**
Human toxicity, non-cancer	CTUh	5,07E-07	4,90E-07	1,30E-06	2,30E-06
Human toxicity, cancer	CTUh	2,52E-08	1,36E-08	1,11E-08	4,99E-08
Ecotoxicity, freshwater	CTUe	1.563,45	854,74	784,98	3.203,17

Sodium chloride is generated as a co-product at Villarrubia de Santiago plant:

Co-products	Quantity	Destination
Sodium chloride	3.365,05 ton	For sale

Note: values obtained from factory data and estimates.

9. ADITIONAL INFORMATION.

As an additional environmental information of the product, the values obtained with the application of the environmental impact assessment methodology ILCD 2011 Midpoint+ are shown below. This methodology is proposed in the *Commission Recommendation 2013/179/EU of 9 April 2013 on the use of common methods to measure and communicate the life cycle environmental performance of products and organisations*.

Values for the environmental impact categories considered in the applied methodology are shown in the following tables for the declared unit of 1.000 kg of standard sodium sulphate and colored sodium sulphate.

Potential environmental impacts - 1.000 kg standard sodium sulphate					
Impact category	**Unit**	**Upstream**	**Core Process**	**Downstream**	**Total**
Climate change	kg CO2 eq	4,81E+01	1,07E+02	1,37E+02	2,92E+02
Ozone depletion	kg CFC-11 eq	1,64E-05	8,49E-06	2,53E-05	5,03E-05
Human toxicity, non-cancer effects	CTUh	1,39E-06	8,73E-06	1,90E-05	2,91E-05
Human toxicity, cancer effects	CTUh	1,18E-07	1,34E-07	7,80E-08	3,31E-07
Particulate matter	kg PM2.5 eq	1,41E-02	1,86E-02	4,59E-02	7,86E-02
Ionizing radiation HH	kBq U235 eq	2,19E+00	1,38E+01	8,61E+00	2,47E+01
Ionizing radiation E (interim)	CTUe	1,60E-05	1,05E-04	6,10E-05	1,82E-04
Photochemical ozone formation	kg NMVOC eq	1,76E-01	1,32E-01	4,51E-01	7,59E-01
Acidification	molc H+ eq	1,87E-01	2,51E-01	4,78E-01	9,16E-01
Terrestrial eutrophication	molc N eq	6,44E-01	6,63E-01	1,69E+00	3,00E+00
Freshwater eutrophication	kg P eq	3,12E-04	1,61E-03	8,60E-05	2,01E-03
Marine eutrophication	kg N eq	5,46E-02	4,49E-02	1,53E-01	2,53E-01
Freshwater ecotoxicity	CTUe	8,58E+00	1,31E+01	3,89E+02	4,11E+02
Land use	kg C deficit	3,18E+01	1,12E+02	1,24E+00	1,45E+02
Water resource depletion	m3 water eq	3,77E+00	3,91E-01	7,48E-04	4,16E+00
Mineral, fossil & ren resource depletion	kg Sb eq	1,00E-02	2,43E-04	3,58E-05	1,03E-02

Potential environmental impacts - 1.000 kg colored sodium sulphate					
Impact category	**Unit**	**Upstream**	**Core Process**	**Downstream**	**Total**
Climate change	kg CO2 eq	1,11E+02	2,08E+02	1,37E+02	4,56E+02
Ozone depletion	kg CFC-11 eq	3,31E-05	1,09E-05	2,53E-05	6,94E-05
Human toxicity, non-cancer effects	CTUh	3,69E-06	1,12E-05	1,90E-05	3,39E-05
Human toxicity, cancer effects	CTUh	2,79E-07	1,76E-07	7,80E-08	5,33E-07
Particulate matter	kg PM2.5 eq	3,78E-02	2,39E-02	4,59E-02	1,08E-01
Ionizing radiation HH	kBq U235 eq	3,71E+00	1,74E+01	8,61E+00	2,97E+01
Ionizing radiation E (interim)	CTUe	2,73E-05	1,32E-04	6,10E-05	2,20E-04
Photochemical ozone formation	kg NMVOC eq	3,42E-01	1,72E-01	4,51E-01	9,65E-01
Acidification	molc H+ eq	4,55E-01	3,23E-01	4,78E-01	1,26E+00
Terrestrial eutrophication	molc N eq	1,42E+00	8,99E-01	1,69E+00	4,01E+00
Freshwater eutrophication	kg P eq	1,50E-03	2,04E-03	8,60E-05	3,63E-03
Marine eutrophication	kg N eq	1,09E-01	6,26E-02	1,53E-01	3,25E-01
Freshwater ecotoxicity	CTUe	2,21E+01	2,28E+01	3,89E+02	4,34E+02
Land use	kg C deficit	7,16E+01	1,39E+02	1,24E+00	2,12E+02

Potential environmental impacts - 1.000 kg colored sodium sulphate					
Impact category	**Unit**	**Upstream**	**Core Process**	**Downstream**	**Total**
Water resource depletion	m3 water eq	7,07E+00	5,44E-01	7,48E-04	7,61E+00
Mineral, fossil & ren resource depletion	kg Sb eq	1,14E-02	3,03E-04	3,58E-05	1,18E-02

10. DIFFERENCE WITH PREVIOUS VERSIONS OF THIS EPD.

In this version of the EPD the results of transport to clients have been corrected.

11. REFERENCES.

- Reference PCR document:
  PCR 2011:18 Basic inorganic chemicals not elsewhere classified, version 2.12. UN CPC 342. DATE 2020-05-28. VALID UNTIL: 2021-03-01.
  EPD International (2019) General Programme Instructions for the Internacional EPD® System. Version 3.01, date 2019-09-18, based on ISO 14025 and ISO 14040/14044. www.environdec.com
- Environmental Impact Assessment Methodologies:
  - CML-IA baseline V3.06 / EU25+3,2000.
  - EF 3.0 Method (adapted) V1.00 / EF 3.0 normalization and weighting set
  - ReCiPe Midpoint (E) V1.13 / Europe Recipe E
  - AWARE (Available WAter REmaining) version 1.01.
  - EDIP 2003 V1.07
  - Cumulative Energy Demand (LHV) V1.00
  - ILCD 2011 Midpoint+
- Databases and environmental impact methodologies applied through SimaPro 9.1.0.8.
- LCA, by Abaleo S.L., production of standard sodium sulphate and colored sodium sulphate de Minera Santa Marta S.A.
- EN ISO 14040:2006. Environmental management — Life cycle assessment — Principles and framework (ISO 14040:2006).
- EN ISO 14044:2006. Environmental management — Life cycle assessment — Requirements and guidelines (ISO 14044:2006).
- EN ISO 14020:2002. Environmental labels and declarations - General principles.
- EN ISO 14025:2010. Environmental labels and declarations - Type III environmental declarations - Principles and procedures (ISO 14025:2006).
- *COMMISSION RECOMMENDATION, 2013/179/UE, of 9 april 2013, on the use of common methods to measure and communicate the life cycle environmental performance of products and organisations*.
- ILCD Handbook (International reference life cycle data system). 2011.

12. ANNEX. ELECTRICAL MIX USED.

The electrical mix of the supplier company of the year 2019 has been used in this EPD. It has been composed from the Annual Report of the National Commission of Markets and Competition (CNMC). The GHG emissions of this mix, assessed with the IPCC 2013 methodology (100-year), are 77,41gCO_2e/MJ.

CNMC COMISIÓN NACIONAL DE LOS MERCADOS Y LA COMPETENCIA

MIX COMERCIALIZADORAS	ENARA GESTIÓN Y MEDIACIÓN, S.L.	ENDESA ENERGÍA, S.A.	ENDESA GENERACIÓN, S.A.	ENDI ENERGY TRADING SOCIEDAD LIMITADA	ENELUZ 2025, S.L.	ENERCOLUZ ENERGÍA, S.L.	ENERGÉTICA DEL ESTE SL	ENERGÍA COLECTIVA, S.L.
Renovables	100,0%	16,1%	0,0%	100,0%	100,0%	18,9%	100,0%	100,0%
Cogeneración de Alta Eficiencia	0,0%	5,4%	100,0%	0,0%	0,0%	1,4%	0,0%	0,0%
Cogeneración	0,0%	9,1%	0,0%	0,0%	0,0%	9,2%	0,0%	0,0%
CC Gas Natural	0,0%	29,0%	0,0%	0,0%	0,0%	29,4%	0,0%	0,0%
Carbón	0,0%	6,7%	0,0%	0,0%	0,0%	6,8%	0,0%	0,0%
Fuel/Gas	0,0%	3,0%	0,0%	0,0%	0,0%	3,1%	0,0%	0,0%
Nuclear	0,0%	29,4%	0,0%	0,0%	0,0%	29,9%	0,0%	0,0%
Otras	0,0%	1,3%	0,0%	0,0%	0,0%	1,3%	0,0%	0,0%
EMISIONES DE DIOXIDO DE CARBONO kg de dióxido de carbono por kWh	0,00 A	0,27 E	0,31 F	0,00 A	0,00 A	0,26 E	0,00 A	0,00 A
RESIDUOS RADIACTIVOS AA Miligramos por kWh	0,00 A	0,69 F	0,00 A	0,00 A	0,00 A	0,70 F	0,00 A	0,00 A

VERIFICATION STATEMENT CERTIFICATE

CERTIFICADO DE DECLARACIÓN DE VERIFICACIÓN

Certificate No. / Certificado nº: EPD05301

TECNALIA R&I CERTIFICACION S.L., confirms that independent third-party verification has been conducted of the Environmental Product Declaration (EPD) on behalf of:
TECNALIA *R&I CERTIFICACION S.L., confirma que se ha realizado verificación de tercera parte independiente de la Declaración Ambiental de Producto (DAP) en nombre de:*

MINERA DE SANTA MARTA, S.A.
Pº Independencia, nº 21
50001 ZARAGOZA - SPAIN

for the following product(s):
para el siguiente(s) producto(s):

STANDARD SODIUM SULPHATE and COLORED SODIUM SULPHATE.
SULFATO SODICO ESTANDAR y SULFATO SODICO COLOREADO.

with registration number **S-P-02908** in the International EPD® System *(www.environdec.com)*
*con número de registro **S-P-02908** en el Sistema International EPD® (www.environdec.com)*

it´s in conformity with:
es conforme con:

- **ISO 14025:2010 Environmental labels and declarations. Type III environmental declarations.**
- **General Programme Instructions for the International EPD® System v.3.01.**
- **PCR 2011:18 Basic inorganic chemicals not elsewhere classified, v2.12**
- **CPC code: 3423 Basic inorganic chemicals n.e.c.**

Issued date / *Fecha de emisión:*	26/03/2021
Update date / *Fecha de actualización:*	26/03/2021
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Serial Nº / *Nº Serie:*	EPD0530100-E

Carlos Nazabal Alsua
Manager

This certificate is not valid without its related EPD.
Este certificado no es válido sin su correspondiente EPD.

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ENAC CERTIFICACIÓN Nº 125/C-PR283