TREATMENT OF NON-HAZARDOUS ORGANIC WASTE TO OBTAIN COMPOST

Document prepared by Hisoil SRL

Version 1 04/11/2024

Monitoring Report	
Name of project	*Treatment of non-hazardous organic waste to obtain compost.*
BCR Project ID	*POLARIS NETWORK ESPAÑA S.L.*
Registration date of the project activity	*LEGAL REPRESENTATIVE: JORGE MARCOS MADRID* *marcosmendez.spain@polarislatam.com*
Project holder	*Hisoil SRL*
Contact	*gprieto@Hisoil.com.ar 54-9 11 4986-1488* *Street 20 de Junio S/N, municipality of Almirante IRIZAR, Partido de Exaltación de la Cruz, Buenos Aires Province, Argentina* *https://Hisoil.com.ar/*
Version number of the Project Document applicable to this monitoring report	*Version 1* *31/07/2024*
Applied methodology(ies)	*AMS.III-F. Avoidance of methane emissions through composting. Version 12.*
Project location (Country, Region, City)	*Argentina, Exaltación de la Cruz, Cardales, La Rinconada.*

Monitoring Report	
Project starting date	*01/08/2019.*
Quantification period of GHG reductions/removals	*01/08/2019 to 31/07/2029.*
Monitoring period number	*1.*
Monitoring period	*01/08/2019 to 31/07/2023.*
Amount of emission reductions or removals achieved by the project in this monitoring period	*38,780 tonnes of CO_2e*
Contribution to Sustainable Development Goals	– *SDG 8. Decent work and economic growth.* – *SDG 9. Industry, Innovation and Infrastructure.* – *SDG 11. Sustainable Cities and Communities.* – *SDG 12. Responsible consumption and production.* – *SDG 13. Climate action.*
Special category, related to co-benefits	*No special category.*

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1 General description of project

Hisoil's project is dedicated to specific environmental sanitation tasks that seek to contribute to the development of a balance between society, business and the environment, for which it is responsible for researching and providing viable and sustainable solutions to complex issues such as urban solid waste and organic waste by composting these residues and obtaining a commercially viable product as a result.

The project involves reducing the emission of methane into the atmosphere from organic matter that otherwise would have been left to decompose anaerobically in a solid waste disposal site (SWDS). Controlled aerobic treatment through biomass composting is introduced in the project activity.

As BCR Standard version 3.4 established, Hisoil's project does NOT involve any of the activities below:

−Burning, oxidation, or use of gas in a landfill.

−Use of gases, including syngas as a renewable energy source.

−Use or replacement of technology to eliminate or reduce the generation of GHG in solid waste treatment systems.

−Use or replacement of technology to eliminate or reduce the generation of GHG in wastewater treatment.

−Burn or use of gas in systems of wastewater treatment.

As the methodology AMS-III.F version 12.0 established, Hisoil's project does NOT involve any of activities the below:

−Recover or combust landfill gas from disposal site.

−Undertake controlled combustion of the waste that is not treated biologically in a first step.

−Recover biogas from wastewater treatment.

−Co-digestion of organic matters.

−Co-composting wastewater and solid biomass waste.

−Animal manure treatment.

Although the company does manage animal manure, the required data to correctly apply the calculations specified by the methodology have not been properly collected so far, therefore to ensure data traceability and reduce uncertainty it has not been included in the project. Although, manure is not considered at this stage Hisoil is working to improve and adapt data collection and sampling plans to effectively incorporate it in future measurements.

1.1 Sectoral scope and project type

Project type: Activities related to Handling and disposing of waste.

The methodology AMS-III.F: "Avoidance of methane through composting" is applicable to the composting of the organic fraction of municipal solids and biomass residues from agricultural or agro-industrial activities.

For the validation and verification of projects and programs of activities by a designated operating entity (DOE) that uses this methodology, the application of sectoral scope 13 is mandatory.

1.2 Project start date

The project starts on 01/08/2019. This was the first day of reception of waste by Hisoil, so it's when the project's activities started. As mentioned in BCR Standard, the project begins less than five years before the start of validation.

1.3 Project quantification period

The time period for quantification of GHG emission reduction is 10 years without renovation, which is allowed by BCR Standard "for activities in the energy, transport and waste sector projects". The time limits for Hisoil's project is since 01/08/2019 to 31/07/2029.

1.4 Project location and project boundaries

The project boundary is defined as the physical, geographical location of the following:

a) The reception area where the accepted waste is temporarily stocked.
b) The composting facility, where the treatment of biomass through composting takes place.

c) *The areas where the compost is stored until sale.*
d) *The lixiviating pools system used to water the compost piles.*
e) *The transports within the facilities of waste and compost during the regular organization operations.*

INCOME	*PRODUCTION*	*DEPARTURES*
- Organic non-hazardous residues from different origins. *- Fuel consumption until reaching the plant (doesn't correspond to Hisoil)* *- Packing material*	*- Composting and packaging* *- Power consumption* *- Fuel consumption*	*- Distribution.* *-Electricity consumption (included in production)*

The project is limited to the Buenos Aires Metropolitan Area (AMBA), determined by the capital Buenos Aires and 40 municipalities of Buenos Aires Province.

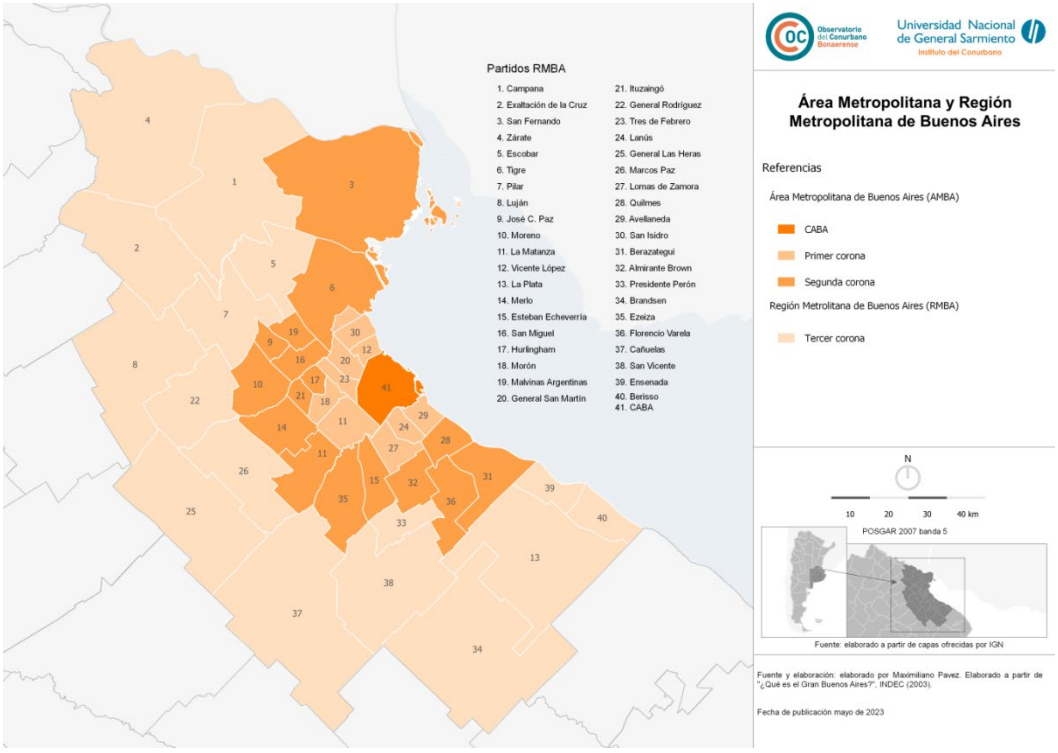

Figure 1. Map of the Metropolitan and Regional Area of Buenos Aires. Source: Observatorio del Conurbano Bonaerense, Universidad Nacional del General Sarmiento, 2023.

Physical address	*Geographic coordinates/Other information*
Street 20 de Junio S/N, municipality of Almirante IRIZAR, Partido de Exaltación de la Cruz, Buenos Aires Province, Argentina	*34°22'29.4"S 58°56'48.9"W*

https://maps.app.goo.gl/9EPZsag8GMoRhtTg8

Figure 2. Aerial view of Hisoil's installations. Source: Google.

1.5 Summary Description of the Implementation Status of the Project

The total area of Hisoil is 50,242.33 m2, of which 41,242.33 m2 are used for composting and production. Within the facilities of the organization, the following process takes place: cargo control and reception process, aerobic treatment for composting (including the compost preparation and monitoring and control), product preparation and sale and distribution.

The process of waste reception are mentioned in the flow chart bellow and described next.

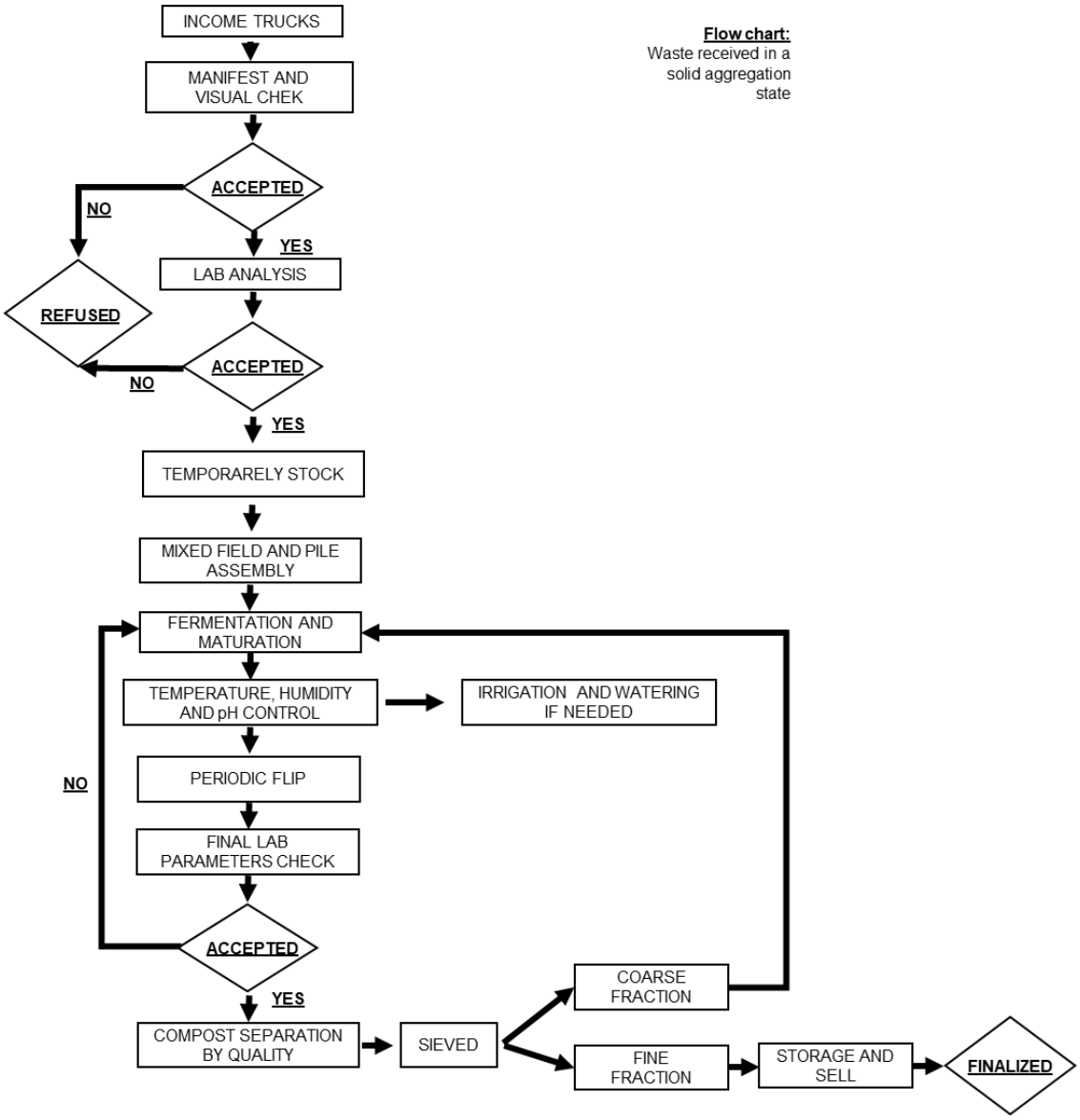

Figure 3. Chart of the process for the reception of waste in Hisoil.

The project starts on 01/08/2019. This was the first day of reception of waste by Hisoil, so it's when the project's activities started. As mentioned in BCR Standard, the project begins less than five years before the start of validation.

The time period for quantification of GHG emission reduction is 10 years without renovation, which is allowed by BCR Standard "for activities in the energy, transport and

waste sector projects". The time limits for Hisoil's project is since 01/08/2019 to 31/07/2029.

As mentioned in BCR Standard, the project begins less than five years before the start of validation. For the first four years (from 01/08/2019 to 31/07/2023), the emissions have been verified because of the validation of amount of waste used by the project holder. Hence, the calculations of the emission reductions in next years (since 01/08/2023 to 31/07/2029) are estimations based on the results of the fourth year.

The results of the calculations of the emission reductions in this first monitoring period are:

Year		*Baseline (ton CO_2e)*	*Project Emission (ton CO_2e)*	*Reduction (ton CO_2e)*
1	*1 august 2019 - 31 july 2020*	*8,103*	*2,347*	*5,756*
2	*1 august 2020 - 31 july 2021*	*14,476*	*3,829*	*10,647*
3	*1 august 2021 - 31 july 2022*	*13,962*	*3,902*	*10,060*
4	*1 august 2022 - 31 july 2023*	*17,283*	*4,966*	*12,317*
TOTAL (ton CO_2e)		*53,824*	*15,044*	*38,780*
Reduction annual average (ton CO_2e)				*9,695*

2 Title, reference and version of the baseline and monitoring methodology(ies) applied to the project

The project applies the methodology outlined in sector 13 of the Clean Development Mechanism (CDM) "Waste handling and disposal"; specifically, AMS-III.F "Avoidance of methane through composting", version 12.0.

Also, the tools applied for the calculations are:

- *Tool 4. Emissions from solid waste disposal sites. Version 08.1.*

- *Tool 13. "Project and leakage emissions from composting" Version 02.0.*
- *Tool 5. "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" Version 03.0.*

3 Double Counting and Participation under Other GHG Programs.

The BCR Tool "Avoiding Double Counting (ADC)" sets out the principles and requirements for the BCR Program, to avoid double counting of emission reductions or removals. Following the requirements, a letter should be provided to ensure that the host country of the project activity acknowledges that the project activity reduces emissions. Also, the focal point declares that the project is duly registered in the public registry system of the country.

In Argentina, the public body responsible for register the projects that mitigate the effects of global warming is the ReNaMi, (Registro Nacional de Proyectos de Mitigación del Cambio Climático) or National Register of Global Warming Mitigation Projects. However, this register specifies that even though is a voluntary register, it's not possible to voluntarily register a project, but instead, the project would be included when register and validated by the corresponding standard applied.

Hisoil is committed to formalize the inscription in both registers, communicating to the ReNaMi as soon as the register in BioCarbon is completed and providing the Argentinians authorities with all the information to improve the data in mitigation projects and the Nationally Determined Contribution (NDC).

Also, it's important to remark that the project submitted has never been presented to any other platform of VCCs or other register that could lead to a double counting to demonstrate compliance with GHG mitigation goals. That also means that the GHG mitigation effects of the project have never been calculated prior to the registration process and without its prior quantification it is not possible to use or confuse the results for any kind double counting.

4 Contribution to Sustainable Development Goals (SGD)

According to the SDG Tool provides by BCR, which is annexed to this PDD, this project is aligned with five SDG. In the SDG tool from BCR, the verification period is divided by

three periods: ex-post (since 1/august/2019 to 31/July/2023) and two ex-ante periods, (since 1/august/2023 to 31/July/2026 and since 1/august/2026 to 31/July/2029).

This project is aligned with five SDG:

- SDG 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all: Specifically, the contribution is in the global target 8.8: Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment; with the indicator 8.8.1 Frequency rates of fatal and non-fatal occupational injuries, by sex and migrant status. The project involves safety programs and mandatory courses in the workspace to increase security and therefore reducing the frequency of both fatal and non-fatal occupational injuries.

SDG, global target and project activity (UNIT)	*VERIFICATION PERIOD*
	1/august/2019 to 31/July/2023
8.8.1. Number of fatal and non- fatal occupational injuries.	*5*

- SDG 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation: Specifically, the contribution is in the global target 9.5 enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending; with the indicator 9.5.1 Research and development expenditure as a proportion of GDP. The project involves visits to the installations and collaboration program with public university students and tries to enhance scientific and technological research by creating collaboration programs.

SDG, global target and project activity (UNIT)	*VERIFICATION PERIOD*
	1/august/2019 to 31/July/2023

9.5.1 Number of visits and collaboration programs developed	*2*

SDG 11. Make cities and human settlements inclusive, safe, resilient and sustainable: Specifically, the contribution is in the global target 11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management; with the indicator 11.6.1 Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities. The project involves the treatment of organic urban solid wastes treated and transformed into compost and increases the proportion of urban solid waste adequately discharged

SDG, global target and project activity (UNIT)	*VERIFICATION PERIOD*
	1/august/2019 to 31/July/2023
11.6.1 Tons of organic urban solid wastes treated (tons)	*113,328.30*

- SDG 12. Ensure sustainable consumption and production patterns: Specifically, the contribution is in the global target 12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse; with the indicator 12.5.1 12.5.1 National recycling rate, tons of material recycled. The project involves the Recycling and reusing organic non-hazardous waste to transform it into compost increasing the national recycling rate.

SDG, global target and project activity (UNIT)	*VERIFICATION PERIOD*
	1/august/2019 to 31/July/2023
12.5.1 Tons of waste reuse in the composting process (tons)	*113,328.30*

- SDG 13. Take urgent action to combat climate change and its impacts: Specifically, the contribution is in the global target 13.2 Integrate climate change measures into national policies, strategies and planning; with the indicator 13.2.1 13.2.1 Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other). By composting non-hazardous organic waste, the project reduces the generation of greenhouse gas emissions.

SDG, global target and project activity (UNIT)	*VERIFICATION PERIOD*
	1/august/2019 to 31/July/2023
13.2.1 Tons of CO_2 equivalent emissions avoided thanks to the project activity (t CO_2 e)	*38.780*

<u>Procedures for assessing the project's contribution to the Sustainable Development Goals (SDGs).</u>

The procedures to assess the project's contribution to SDG depends on the nature of the information required to monitor the extent of the contribution:

SDG	*Procedure*
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.	*To monitor the number of courses, and formation programs to boost safety in the workspace and control the number of accidents occurs within the company's installations.*

9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.	*To carry out collaboration programs with public research and education entities to boost innovation and public-private collaboration in waste treatment and sustainable industries.*
11. Make cities and human settlements inclusive, safe, resilient and sustainable.	*To correctly treat urban solid wastes by a proper separation and destination to a recycling process by composting them.*
12. Ensure sustainable consumption and production patterns.	*Recycle of every suitable residue collected in Hi-soil through a composting process.*
13. Take urgent action to combat climate change and its impacts.	*To monitor and control the emissions avoided by composting organic waste instead of its deposition in landfills.*

Criteria and indicators related to the project's contribution to sustainable development goals, applicable to the project activities proposed by the project holder.

Criteria and indicators	*Measure (unit)*
8.8.1 Frequency rates of fatal and non-fatal occupational injuries, by sex and migrant status.	*Number of fatal and non- fatal occupational injury reduction.*
9.5.1 Research and development expenditure as a proportion of GDP.	*Number of visits and collaborative programs developed.*
11.6.1 Proportion of urban solid waste regularly collected and with adequate	*Tons of organic urban solid wastes treated.*

final discharge out of total urban solid waste generated, by cities.	
12.5.1 National recycling rate, tons of material recycled.	*Tons of waste reuse in the composting process.*
13.2.1 Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other).	*Tons of CO_2 equivalent emissions avoided thanks to the project activity.*

5 Compliance with Applicable Legislation

Non-hazardous residues as the ones used in the valorization process of Hisoil are regulated by the Law of Integral Management of Household Wastes N° 25.916. This regulation stablished that transportation to landfills or final disposition sites is the correct treatment, although it encourages the implementation of valorization systems to boost circular economy without mentioning any specific process. Hi-Soil is, therefore, going further than mandatory regulations.

There is a regulatory frame determined by the joint resolution 1/2019 or RESFC-2019-1-APN-SECCYMA#SGP which specifies in Annex 1 the regulatory framework for the production, registration and application of compost in Argentina. All the specifications are fulfilled by Hisoil to ensure that both the process and final product specifications fulfil the specifications of the aforementioned resolution. It should also be noticed that the resolution clarifies that composting is not a mandatory activity but a desirable one to bust circular economy in line with the Law Nº 25.916.

In order to fulfil those legal obligations, Hisoil is required by the Environmental Direction of the Municipality to undergo an annual renovation of the CAA (Environmental Aptitude Certification in Spanish). This renovation depends on the result of an Environmental Audit that is also annually conducted by an authorised third part. This audit checks the process, installations, safety and labour conditions, fire and environmental risks and also specific parameters regarding both air and water quality controls.

Hisoil complies with all the regulations required at local, regional and national level, in addition to having updated all the necessary permits, as shown by the following links to the documents:

- *Auditoria Ambiental LEY 11.459 BIOCOM de Gabriel Prieto EXPEDIENTE N° EX-2023 02018892-- GDEBA-DRYEAIMAMGP.*
- *Monitoreo Ambiental calidad del aire INFORME CADENA DE CUSTODIA Nro 0000991920.*
- *Monitoreo Ambiental Pozos Freáticos INFORME CADENA DE CUSTODIA Nro 0001069471.*
- *Renovación CAA 2023 Nº De Expediente: 4036-56.386-0-2023.*
- *RESO-2023-28-GDEBA-SSRSUYECMAMGP.*
- *Permiso de Uso Disposición 0373/19-1.*

The project location corresponds to an area where there are not indigenous communities or traditional territories according to the Indigenous Affairs Institute INAI ("Instituto Nacional de Asuntos Indígenas", in Spanish), the governmental body of Argentina that regulates and controlled issues related to traditional an ingenuous communities within the country. The following map provides information of the Territories with actual Occupation, Traditional and Public according to the law 26.160 that clearly specifies that there are not indigenous territories near the project location or spatial limit.

Figure 4. Map of territories with current, traditional and public occupation (Law 26,160) of the Indigenous Affairs Institute. (Source; INAI Instituto Nacional de Asuntos Indígenas")

6 Climate change adaptation

Hisoil is determined to take action and developed measures and protocols to reduce the GHG emissions generated by its activity. In order to make proper decisions, it's of extraordinary importance to have a realistic and accurate starting point. With that in mid Hisoil has calculated its carbon footprint corresponding to years 2021 and 2022.

The reason behind this calculation process is to both observed how the principal emissions are distributed according to the three scopes considered in GHG protocol being those:

- *Scope 1: direct emissions originated as a result of the company's direct and controlled activity and company owned vehicles.*
- *Scope 2: indirect emissions generated by the purchase of electricity, steam, heat or any other energy source.*

- *Scope 3: indirect emissions not included in scope 2, that occur in the value change of the company, both upstream and downstream.*

Once the information has provided with a measurable starting point with a two-year comparison (with an increase in volume and activity between 2022 and 2021) some of the measures already in place are:

- *Monitoring and periodic control of compost piles: this allows to adjust the use of machinery use to flip the piles and that way minimizing the emissions from truck movement and machinery related to both scopes 1 and 3.*

- *Energy efficiency measures: good practices in energy efficiency are in place in the company to minimize the electricity consumption and the scope 2 emissions related to them.*

Hisoil activity has exponentially increased in year 2023 making difficult to properly monitor the effectiveness of the measures in place. However, all of those activities considered as good practice in GHGs reduction have been kept in place and new measures regarding electricity and energy consumption, and sustainable transportation fostering among the employees, as well as indications to both suppliers and clients regarding their respective carbon footprint are being considered for further implementation next year.

7 Carbon ownership and rights

All the carbons rights will remain within the company Hisoil.

The project location corresponds to an area where there are not indigenous communities or traditional territories according to the Indigenous Affairs Institute INAI (Instituto Nacional de Asuntos Indígenas in Spanish), the governmental body of Argentina that regulates and controlled issues related to traditional and ingenuous communities within the country.

The following map provides information of the Territories with actual Occupation, Traditional and Public according to the law 26.160 that clearly specifies that there are not indigenous territories near the project location or spatial limit, as can be seen in figure 6 above.

Hisoil is the owner of the land and the main stakeholder and responsible for production, assuming all the costs, risks and will be the one in control of the carbon rights that will remain in its entirety within the company.

Hisoil will have a 100% of the carbon rights and although it will continue with its collaborations and activities with local communities and stakeholders for social actions, there is no need of additional agreements regarding this topic.

8 Environmental Aspects

To demonstrate that the project activities do not cause any net harm to the communities and/or environment it's been applied BCR Tool "Sustainable Development Safeguards, SDSs, (formerly known as the No Net Harm Environmental and Social Safeguards NNH)".

Through the use of this tool, all the items have been evaluated according to the criteria specified to address the impact of the project on the natural environment, communities and socio-economical aspects.

Land use: Resource Efficiency and Pollution Prevention and Management

Could the project/initiative activities potentially entail or result in:	*Response*	*Mitigation or preventive action*
Air and water pollution resulting from project-related emissions, discharges, or improper waste disposal practices?	*Potentially*	*There are plans for monitoring and control air quality to constantly check its compliance with legislation.*
Land degradation or soil erosion, leading to the loss of productive land?	*No*	*Composting is a process that improves the soil productive potential note compromise it.*
Contaminating soils and aquifers with pollutants, chemicals, or hazardous materials?	*No*	*Wastes treated in the facility are all considered organic non-hazardous and the composting process does not require the addition of any chemicals.*
Detrimental excess of nutrients caused by the use of fertilizers	*No*	*No pesticides are used in the composting process*

and/or pesticides?		
Inadequate waste management practices, leading to the improper disposal of project- related waste and potential environmental harm?	*No*	*The project activity is dedicated to waste management and treatment to obtain compost, therefore all the process related to waste management are as efficient as possible.*
Inefficient resource use, including energy, water, and raw materials, leading to increased environmental footprint?	*Potentially*	*The income and cargo controlled with the lab tests are implemented to determined the amount and frequency of certain process like piles flip that required energy and fuel consumption.*
Losing productive agricultural land to urban expansion, impacting local food production, rural livelihoods, and overall food security?	*No*	*The project activity imposes no risk to food security but instead provide with an organic sustainable source of fertilizers applicable to agricultural activities.*
Urbanization, leading to the urban heat island effect, impacting local climates and potentially contributing to higher energy consumption for cooling?	*No*	*The project activity does not imply urban growth or the construction of new buildings and facilities that significantly contribute to higher energy consumption.*
Disrupting natural drainage systems, leading to increased vulnerability to floods, soil erosion, or other hydrological issues?	*Potentially*	*There are three lixiviation pools with in the installations to recollect the water rain and prevent floods. That water is also used in the composting process if needed.*
Inadequate recycling and reuse of project-related resources, leading to unnecessary waste and environmental impact?	*No*	*Every reusable or composting waste received is used in the project activity, the income control measures are in place to ensure that all the waste received is treatable and suitable to be transformed into compost.*

Deforestation or degradation of forested areas impacting carbon sequestration, biodiversity, and ecosystem services?	*No*	*The project activity does not required deforestation but the opposite. There is a vegetal barrier surrounding the project area to minimize odor and visual impact.*
Changes in agricultural practices, such as intensive monoculture, leading to soil degradation, loss of biodiversity, and increased vulnerability to pests?	*No*	*The project does not need or impulse changes in agricultural practices that lead to monoculture, soil or biodiversity damage.*
Urbanization or infrastructure development leading to changes in land use patterns and potential habitat fragmentation?	*No*	*The project activity does not require of significant urbanization or infrastructure to be fully functional.*

Water

Could the project/initiative activities potentially entail or result in:	*Response*	*Mitigation or preventive action*
Exacerbating water scarcity or depleting water resources?	*Potentially*	*The lixiviation pools collect rain water to avoid having to use water from reservoirs and aquifers*
Water pollution, including contamination of rivers, lakes, oceans, or aquifers as a result of project-related activities such as emissions, spills, or waste disposal?	*Potentially*	*There are several phreatic wells within the installations and water quality control analysis are conducted regularly*
Disrupting aquatic ecosystems, including marine life, river ecosystems, or wetlands, due to changes in water quality,	*No*	*The project does not imply any spilling of waste in aquatic ecosystems and does not have any affect in their*

temperature, or flow patterns?		*temperature or flow patterns.*
Altering coastal dynamics, including erosion, sedimentation, or changes in sea levels?	*No*	*The project is not located close to the coastline.*
Displacing or negatively impacting wetland habitats, affecting the unique biodiversity and ecosystem services provided by wetlands?	*No*	*The project is not located close to any wetland.*
Altering river flow patterns, potentially leading to downstream impacts on water availability, sediment transport, and ecosystems?	*No*	*The project does not imply spilling waste or any other negative activity in rivers.*
Depleting aquifers and groundwater resources as a result of the project's activities, impacting local water supplies and ecosystem sustainability?	*Potentially*	*The three lixiviation pools constructed collect rain water to avoid having to use water from reservoirs and aquifers.*
Mountainous terrains, including changes in snowmelt patterns, glacier dynamics, or alterations in water runoff?	*No*	*The project does not take place in mountainous habitats.*
Disrupting lake ecosystems, including changes in water quality, nutrient levels, or habitat disturbance?	*No*	*The project does not take place close to lakes.*

Contributing to ocean acidification, with potential consequences for marine life and coral reef ecosystems?	*No*	*The project does not take place close to the coastline and does not use any chemical that could be potentially dangerous in case that ended in a river that might transported to the sea.*

Biodiversity and ecosystem

Could the project/initiative activities potentially entail or result in:	*Response*	*Mitigation or preventive action*
Habitat destruction or fragmentation, impacting biodiversity by reducing available habitats for various species?	*No*	*The project does not compromise the viability of species around the project area and does not used chemicals, fertilizers or other potentially dangerous substances.*
Introducing invasive species, which could negatively affect native flora and fauna and disrupt local ecosystems?	*No*	*The project activity does not imply any introduction of foreign species.*
Altering ecosystem dynamics, including changes in species composition, trophic interactions, or nutrient cycles on the environment?	*No*	*The project does not impact ecosystem dynamics.*
Disrupting migration patterns for wildlife species, such as birds, mammals, or aquatic organisms?	*No*	*The project does not interfere with migration habits because it does not significantly transform or modified the previous natural conditions.*
Chemical contamination or pollution negatively impacting biodiversity in soil, water, or air?	*No*	*The project does not use chemicals in the composting process.*

Overexploiting natural resources, such as timber, water, or other materials, leading to declines in biodiversity and ecological balance?	*No*	*The project used organic wastes as raw material without extracting new resources.*
Overharvesting species at rates faster than they can actually sustain themselves in the wild?	*No*	*The project activity does not required harvesting*
Climate change-induced impacts on biodiversity, including shifts in species distributions, changes in phenology, or increased vulnerability to extreme weather events?	*No*	*The project helps with solid waste treatment reducing the amount of GHG release.*
Negatively impacting endangered or threatened species within the project area, either directly or indirectly through habitat changes or other disturbances?	*No*	*The project does not interfere with any endangered species.*
Reducing genetic diversity within populations, potentially leading to decreased resilience and adaptability of species in the face of environmental changes?	*No*	*The project does not interact, fragmented or endangered natural ecosystems.*
Inadequate monitoring and assessment of biodiversity within the project area, making it Challenging to identify and address changes over time?	*No*	*There are not any real or potential impacts in biodiversity that would need a constant monitoring specific program, the regular environmental control plan conducted in the project area is enough.*
Pressure on vulnerable ecosystems?	*No*	*The project is not located in a vulnerable ecosystem.*

Climate Change

Could the project/initiative activities potentially entail or result in:	*Response*	*Mitigation or preventive action*
Increasing greenhouse gas emissions?	*No*	*The project activity avoids greenhouse gas emissions when compare to the baseline scenario.*
changes in habitat suitability for species due to climate change impacts, leading to shifts in species distributions or loss of critical habitat?	*No*	*The project does not significantly modify the habitat of the project area.*
disrupt ecosystem services provided by biodiversity, such as pollination, water purification, and carbon sequestration, affecting overall ecosystem functioning?	*No*	*Within the project area there is a surrounding vegetal barrier with local species that avoid creating barriers to pollinizers or other ecosystems functions.*
the spread of invasive species, leading to competition with native species and alteration of ecosystem dynamics?	*No*	*The project does not require the introduction of any new species.*
increased frequency or intensity of extreme weather events, such as storms, droughts, or floods, which can damage habitats and threaten species survival?	*Potentially*	*To avoid the threat of floods, three lixiviation pools recover the rain water in the project area.*
alteration of the phenology and behavior of species, affecting reproductive cycles, migration patterns, and interactions with other species, disrupting ecosystem	*No*	*The project does not interfere with migration cycles or natural ecosystem dynamics.*

dynamics?		
reducing genetic diversity within species populations due to climate change-induced habitat loss or fragmentation, compromising the adaptive capacity of populations to environmental stressors?	*No*	*The project does not compromise the surrounding ecosystem.*
exacerbation the prevalence of diseases and pathogens among wildlife populations, leading to population declines and ecosystem destabilization?	*Potentially*	*The aerobic decay of organic matter could naturally result in the appearance of pathogens but the composting process exposes then to a temperature close to 70 ^{O}C that eradicates them.*
weakening the resilience of ecosystems to disturbances, making them more susceptible to collapse or regime shifts, with cascading effects on biodiversity and ecosystem function?	*No*	*The project activity does not compromise ecosystem resilience by composting non-hazardous organic matter.*
new challenges in effectively incorporating climate change considerations into biodiversity conservation planning, such as identifying climate-resilient habitats and prioritizing species and ecosystems for conservation action?	*No*	*The project activity does not required a specific ecosystem to be feasible and is located close to urban areas where the potential affection to species is significantly smaller.*
habitat loss, pollution, and overexploitation, amplifying the impacts on biodiversity and complicating conservation efforts?	*No*	*The project activity does not extract natural resources and the modifications in habitat is minimum because all the infrastructure required is temporary.*

9 *Socioeconomic* Aspects

The project activities do not cause any net-harm to the local communities and society in general. To support this, the latest version of BCR Tool regarding Sustainable Development Safeguards has been applied:

Labor and Working Conditions

Could the project/initiative activities potentially entail or result in:	*Response*	*Mitigation or preventive action*
forced labour, or human trafficked labour	*No*	*All the contracts are redacted according to labour laws in Argentina.*
child labour or forced labour practices during the project, either directly or within the project's supply chain?	*No*	*Child labour is illegal and prosecuted in Argentina, none of the companies of the supply chain condone it or participate in it.*
unsafe working conditions, exposing project stakeholders to potential hazards or accidents before, during and after the implementation of the activities?	*No*	*To ensure a correct functioning of the project there is an internal safety manual and specific formation to the employees.*
exploitative labour practices, such as inadequate wages, excessive working hours, or poor working conditions for the personnel engaged during the project activities?	*No*	*Regular inspections take place to renovate the environmental authorization and includes relevant aspects of labour conditions.*
discrimination in employment, including unequal opportunities, biased hiring practices, or unfair treatment based on factors such as gender, ethnicity, or other	*No*	*Human resources have protocols to ensure and protect all the workers regardless their gender, ethnicity or any other characteristic.*

characteristics?		
violating workers' rights, including issues related to freedom of association, collective bargaining, or other fundamental labour rights during the project's activities?	*No*	*Regular inspections take place to renovate the environmental authorization and includes relevant aspects of labour conditions.*
unfair treatment, exploitation, or inadequate protections for contractual workers or migrant laborers?	*No*	*Regular inspections take place to renovate the environmental authorization and includes relevant aspects of labour conditions.*
Inadequate grievance mechanisms, making it challenging for workers to address concerns, report issues, or seek resolution for labour- related problems?	*No*	*Human resources have protocols to ensue and protect all the workers regardless their gender, ethnicity or any other characteristic.*
insufficient social welfare support, such as healthcare, insurance, or other benefits for workers engaged in project activities?	*No*	*All the contracts are redacted according to labour laws in Argentina.*
displacement or negative impacts on local communities due to labor-related issues, including challenges related to employment opportunities and *livelihoods?*	*No*	*The project activity is an opportunity for local employment and hiring from the surrounding areas is considered a good practice.*
lack of training	*No*	*The health and safety measurements in place also include training exercises.*

Gender equality and Women empowerment

Could the project/initiative activities potentially entail or result in:	*Response*	*Mitigation or preventive action*
gender-based discrimination in employment opportunities, recruitment processes, or access to leadership positions, hindering women's participation and advancement?	*No*	*All recruitment processes focus on merit and capability without discrimination or gender consideration*
unequal access to project benefits, resources, or decision- making processes, resulting in disparities between men and women in the distribution of project-related opportunities and rewards?	*No*	*All project benefits and resources are equally distributed among the working personnel*
limited participation and representation of women in project activities, consultations, or community engagements, potentially marginalizing their voices and perspectives?	*Potentially*	*Manual labour jobs tend to attracted a more male oriented profile of workers, human resources try to consider as much women as possible for the available positions to counter that tendency.*
increasing unpaid care work burden on women, such as caregiving responsibilities or household chores, due to changes in community dynamics or time constraints resulting from project activities?	*No*	*This project does not transform the dynamics of the area and local communities.*

limited access to education, training, or capacity-building opportunities for women and girls, inhibiting their ability to develop skills and pursue leadership roles within the project or related industries?	*Potentially*	*The project develops collaboration programs with public university students with a high percentage of women to develop new methodologies and foster innovation in the sector.*
gender-based violence or harassment occurring within project settings or project- affected communities, affecting women's safety, well-being, and ability to participate fully?	*No*	*The project activity and the community where is set up do not increase or affect women' s safety.*
inequitable access to land, natural resources, or economic opportunities, particularly disadvantaging women in rural or indigenous communities affected by land use changes?	*No*	*The project does not imply a land use change that could potentially create disadvantages for women in rural areas.*
underrepresentation of women in decision-making processes, including planning, governance structures, or stakeholder consultations, leading to less inclusive and effective outcomes?	*No*	*The stakeholder' s consultations and relationships are developed through public entities where women are significantly represented*
gender-blind policies, interventions, or project designs that fail to consider the specific needs, priorities, and capacities of women and men, resulting in unintended negative consequences for gender equality and women empowerment?	*Potentially*	*The HR department include especial policies to ensure women' s safety and an inclusive workspace to foster women empowerment.*

limited economic empowerment and livelihood opportunities for women, such as access to credit, entrepreneurship support, or income-generating activities, within project-affected communities?	*No*	*The economic conditions and credit access in the area is similar for all genders.*
health and safety risks that disproportionately affect specific genders within the community, potentially leading to disparate impacts on men and women?	*No*	*The project activity does not imply different safety risk for men and women*
cultural and social barriers that may hinder the advancement of gender equality and women empowerment within project settings or affected communities, such as stereotypes, norms, or traditional roles and expectations?	*No*	*The affected communities are closely located to the city of Buenos Aires, the proximity to a big city makes the stereotypes and norms less present than in isolated rural areas.*
inadequate gender analysis and monitoring mechanisms, resulting in a lack of understanding of gender dynamics and missed opportunities for promoting gender equality and women empowerment?	*No*	*The HR department include especial policies to ensure women ' s safety and an inclusive workspace to foster women empowerment.*

Land Acquisition, Restrictions on Land Use, Displacement, and Involuntary Resettlement

Could the project/initiative activities potentially entail or result in:	*Response*	*Mitigation or preventive action*

Conflict over land resources and/or rights, such as competition for space between different land uses, communities, or stakeholders affected by the project?	*No*	*Project land was available for sale and its acquisition did not create any conflict.*
land acquisition, leading to changes in land ownership patterns and potential conflicts with local communities and landholders?	*No*	*Land acquisition did not change the local dynamics and land distribution.*
imposing restrictions on traditional land use practices, affecting the livelihoods and cultural practices of communities in the project area?	*No*	*The scale of the project does not compromise any other activities in the area and is compatible with the economic activities traditionally developed.*
displacing communities or residents from their homes and lands, leading to social, economic, and cultural disruptions?	*No*	*Project implementation does not require displacing any community members.*
involuntary resettlement or relocation of communities, impacting their access to resources, services, and community networks?	*No*	*Project implementation does not require displacing or resettle any community member.*
communities losing their livelihoods and agricultural productivity as a result of land acquisition or restriction on land use?	*No*	*Project implementation does not limit the agricultural productivity it improves it by generating a high-quality organic fertilizer.*
insufficient compensation and benefits for affected communities and individuals, leading to economic hardships and social discontent?	*No*	*Project activity does not affect local communities to the pint of make a compensation needed.*

lack of free, prior, and informed consent from affected communities, potentially resulting in conflict and challenges to project implementation?	*No*	*Part of the administrative process to obtain public authorizations includes a public notification.*
social and cultural disintegration within displaced communities, leading to the erosion of social cohesion and cultural practices?	*No*	*Project scale and implementation process do not imply any community displacement.*
communities losing access to common resources, such as forests, water bodies, or grazing lands, due to land acquisition or use restrictions?	*No*	*The land where the project is located was not public property.*
inadequate resettlement plans, potentially leading to insufficient support, services, and infrastructure for resettled communities?	*No*	*Project scale and implementation process do not require any resettlement plans.*

Indigenous Peoples and Cultural Heritage

There are not any indigenous communities living in the area of the project and it's not considered traditional land of any indigenous group. Therefore, all the items in this category are non-applicable.

The project location corresponds with an area where there are not indigenous communities or traditional territories according to the Indigenous Affairs Institute INAI (Instituto Nacional de Asuntos Indígenas in spanish), the governmental body of Argentina that regulates and controlled issues related with traditional and ingenuous communities with in the country.

The following map provides information of the Territories with actual Occupation, Traditional and Public according to the law 26.160 that clearly specifies that there are not indigenous territories near the project location or spatial limit, as it can be seen in Figure 6.

Community health and safety

Could the project/initiative activities potentially entail or result in:	*Response*	*Mitigation or preventive action*
exposure to hazardous materials, chemicals, or pollutants, potentially leading to adverse health effects or life-threatening risks?	*No*	*The project activity does not use any hazardous or chemical substance.*
degrading air quality in the project area due to emissions, dust, or other airborne pollutants?	*Potentially*	*To avoid the effects of dust, roads are periodically irrigated.*
water contamination, including pollution of water sources or reduced access to clean water, affecting community health and well-being?	*Potentially*	*There are several phreatic wells within the installations and water quality control analysis are conducted regularly*
increased noise levels or vibrations resulting from project operations, potentially causing disturbances and health impacts for nearby communities?	*Potentially*	*There is a vegetal barrier (trees and bushes) surrounding the project area to minimize the effects of noise produce by trucks and machinery.*
traffic accidents or road safety hazards associated with increased traffic flow or transportation activities related to the project?	*Potentially*	*Roads leading to the project installations are periodically maintained to ensure safety driving conditions.*
workers exposure to hazardous conditions, physical attacks or inadequate safety measures?	*No*	*There is a safety manual and specific training in place.*

increased prevalence of vector- borne diseases or pest infestations as a result of changes in environmental conditions or habitat disruption?	*No*	*Project scale does not create any significant habitat disruption.*
community displacement or involuntary resettlement, leading to social disruption, stress, and negative health outcomes?	*No*	*The project does not create any displacement.*
community mental health and well-being, including stress, anxiety, and social isolation resulting from changes in living conditions or community dynamics?	*No*	*The project does not affect the community dynamic.*
Inadequate emergency preparedness and response mechanisms, leading to challenges in managing and mitigating potential health and safety emergencies?	*No*	*There is a safety manual and specific training in place.*
changes in land use patterns, such as increased exposure to disease vectors or decreased access to natural resources essential for health?	*No*	*The land use change does not increase exposure to disease vectors. Composting creates the adequate conditions to ensure that all the pathogens that might appear during the organic degradation processes died naturally without creating any safety risk.*
inadequate health infrastructure and services in the project area, leading to challenges in addressing community health needs and emergencies?	*No*	*The area has the capability to take cere of health needs with several hospitals located less than an hour away.*

Corruption

Could the project/initiative activities potentially entail or result in:	Response	Mitigation or preventive action
funds allocated for the project/initiative being misappropriated or embezzled through fraudulent practices or kickbacks?	No	All the finds have been allocated by the project partners trough clean and transparent channels.
bribery or kickbacks being solicited or offered to secure contracts, permits, or other project-related approvals?	No	All project related approvals have followed the public channels and administrative requirements.
nepotism or favoritism in the selection of contractors, suppliers, or project personnel, compromising the integrity and fairness of procurement processes?	No	All selection process has been conducted by merit and adequacy of the requirements and the candidate.
fraudulent reporting or manipulation of project data, such as inflating project costs or overstating achievements, to obtain additional funding or meet performance targets?	No	No additional funding has been required to start the project.
conflicts of interest among project stakeholders or personnel, such as individuals with financial interests in project outcomes or decision-makers with personal connections to project contractors?	No	There is not external financing that could lead to conflict of interest.
lack of transparency in project decision-making processes, budget allocations, or contract awards, leading to suspicions of corruption or malpractice?	No	Significant changes in business operation required public authorization base on the nature of the project granting transparency and an audited transition.

weak regulatory oversight or enforcement mechanisms, allowing for corrupt practices to go undetected or unaddressed within project/initiative activities?	*No*	*In addition to the standard regulatory oversight the environmental authorization of the company is periodically renovated and a full audition of the project is required.*
undue influence or pressure exerted by external parties, such as political figures or industry lobbyists, to sway project decisions or gain unfair advantages?	*No*	*Composting industry does not move enough resources or influence to be subjected to lobbying practices.*
Inadequate accountability mechanisms or whistleblower protection, discouraging individuals from reporting instances of corruption or unethical behavior?	*No*	*There are legal mechanism and safety measures to ensure the protection of individuals reporting unethical behavior in Argentina.*
corruption in the environmental permitting process, such as officials accepting bribes to overlook environmental violations or grant permits unlawfully?	*No*	*In addition to the standard regulatory oversight the environmental authorization of the company is periodically renovated and a full audition of the project is required.*
Corruption within subcontracting relationships, such as subcontractors paying bribes to secure favorable terms or win subcontracting opportunities?	*No*	*All the subcontracting process include the evaluation of various candidates and the selection of the one that better meet the requirements and criteria in place for the selection process.*

Economic impact

Could the project/initiative activities potentially entail or result in:	Response	Mitigation or preventive action
compromising healthy competition, resulting in unhealthy rivalry and undermining collaboration and cooperation essential for achieving project goals?	No	The project enters the competition field in equality of conditions to other companies.
Loss of employment opportunities, particularly for vulnerable populations, as a result of changes in economic activities or restructuring?	No	The project generates new employment opportunities without destroying any previous market or job positions.
creating economic dependence, such as tourism or conservation initiatives, leading to vulnerability to fluctuations in project funding or market conditions?	No	The project fosters sustainable industries with positive local impact.
market distortions or increased competition, such as changes in land use patterns or shifts in supply and demand dynamics within local economies?	No	The project does not have the capability to change the market patterns.
increasing the cost of living for local communities as a consequence of project-related developments, such as infrastructure projects or influxes of external workers?	No	The project employs people form close communities.
inequitable distribution of benefits, leading to disparities in wealth, income, or access to resources among different segments of the population?	No	The scale of the project does not have the capability to impact wealth distribution in the region.

losing traditional economic practices and knowledge systems, potentially undermining cultural heritage and resilience to economic shocks in communities?	No	The project does not compromise cultural heritage and resilience to economic shocks because it does not eradicate or substitute traditional activities.
negatively impacting small-scale enterprises or informal economies that rely on natural resources or ecosystem services?	No	It creates new opportunities to small businesses to provide new services and create new synergies.
financial uncertainties, such as project delays, budget overruns, or changes in funding sources, affecting investment confidence and economic stability?	No	The project has already prove to be stable and growing.
limited access to financial resources, such as credit or microfinance services, for entrepreneurs or smallholders affected by project-related changes in land use or economic activities?	No	A small-scale compost project cannot affect the access to financial resources.
lack of economic resilience and adaptive capacity within project-affected communities, particularly in response to external shocks or long-term changes in market conditions?	No	The number of workers and employees are not significant enough to modify the community economic resilience.
inadequate compensation or mitigation measures for economic impacts, such as loss of assets or disruptions to income streams, experienced by individuals or communities?	No	The project does not require compensation measures.

Governance and Compilance

Could the project/initiative activities potentially entail or result in:	*Response*	*Mitigation or preventive action*
Insufficient institutional capacity within project/initiative implementing agencies or partner organizations, leading to challenges in effective governance and project management?	*No*	*The project has already been stablished and function proving its institutional capacity*
weak governance structures and mechanisms within the project/initiative, such as unclear roles and responsibilities, inadequate decision-making processes, and limited transparency and accountability?	*No*	*Base on the nature of the activity developed, the project is subjected to periodic audition process.*
Inadequate stakeholder engagement and participation in project/initiative decision- making processes, leading to governance gaps and reduced project legitimacy?	*Potentially*	*Stakeholder consultation and engagement activities are conducted to ensure a good relationship.*
ineffective or inadequate regulatory frameworks governing project activities, resulting in loopholes, inconsistencies, or gaps in environmental protection and governance standards?	*No*	*Regulatory framework in waste treatment is stablished enough to avoid inefficiencies.*
delays or challenges in obtaining necessary permits, licenses, and approvals for project activities due to regulatory complexities, bureaucratic inefficiencies, or legal requirements?	*Potentially*	*Previous experiences, the project trajectory to date and a fluent communication with public administration are some of the factors that minimize the risk of extended delays making sure that all*

		the regulatory, bureaucratic and administrative requirements are clear.
political interference in project/initiative decision- making processes, such as pressure to prioritize certain projects or interventions based on political agendas rather than scientific or environmental considerations?	*No*	*Waste treatment is always a public interest regardless of political changes and the project gives a viable solution to that issue.*
non-compliance with relevant laws, regulations, permits, and international agreements governing GHG emissions, biodiversity conservation, environmental protection and land use management, leading to legal challenges and reputational risks?	*No*	*All the legal authorizations were obtained before the activity started and the environmental authorization is parodically renovated.*
conflicts of interest among project stakeholders or decision- makers, such as individuals with personal or financial interests that may influence project outcomes or decision-making processes?	*No*	*There is not external financing that could lead to conflict of interest.*
limited access to justice for communities affected by project activities, such as barriers to legal recourse or remedies for grievances related to land rights, environmental harm, or social impacts?	*No*	*The Argentinian state grants the right to its citizens to access justice.*
insufficient monitoring and evaluation mechanisms to assess project performance, impacts, and compliance with governance standards, leading to gaps in	*No*	*The environmental authorization of the company is periodically renovated and a full audition of the project is required.*

accountability and learning?		
Inadequate capacity building *and training for project stakeholders, such as government officials, local communities, and civil society organizations, to effectively participate in project governance and decision-making processes?*	*No*	*Local governments and public administration are the ones that ultimately supervise the project activity bye granted the permissions and authorizations heavily influencing the decision-making processes.*

10 Stakeholders' Consultation

To demonstrate that the project activities do not cause any net harm to the local communities and society in general it's been applied the BCR Tool "Sustainable Development Safeguards, SDSs, (formerly known as the No Net Harm Environmental and Social Safeguards NNH)".

Through the use of this tool, all the items have been evaluated according to the criteria specified to address the impact of the project in the, communities and socio-economical aspects. Therefore all the significant elements have already been mentioned in section 8 Environmental aspects, where the full content of the tool (including socioeconomic aspects) could be consulted.

Hisoil takes a holistic approach about the role of the company in the society, considering all different angles in this approach, by creating excellent relations and being active in sharing knowledge and creating awareness about the project and the positive impact in the environment and the society.

Community: by having meetings with local authorities and with neighbours to discuss the different actions that can be taking to support different initiatives, by organizing visits to Hisoil in order to create awareness about the project and the positive impact, by donating compost for local gardens and by taking care of the road to Hisoil.

Workers: by implementing a Recruitment policy that prioritizes hiring local workers, 66 % of the employees are living in locally and the travel by motorbike, bike or public transport, and for the rest of the employees Hisoil compensates expenses when they travel in sharing cars.

Suppliers: by sharing knowledge to create awareness about the project and its impact in the environment, sending samples of the final products, and giving direct information about the process from waste to compost.

Customers: by sharing knowledge to create awareness about the project and its impact in the environment though the web and social media.

Professional associations: Hisoil is an active member of Asacomp and participates in many events as speaker in professional meetings. Also has receive different visits other companies and associations (Las Marias, Coopertiva Ruo Caba).

University: Hisoil has a close relation with the university of San Martin, INTI Luján (Instituto Nacional de Tecnología Agropecuaria, in spanish), INTI Córdoba (Instituto Nacional de Tecnología Industrial, in spanish) , and has organize different visits to the company to explain the project and the positive impact in the society and the environment.

Authorities: Hisoil collaborates with different authorities to support with the expertise in the development of the sustainability in the Country, by organizing meetings in their premises with Minsiterio de Ambiente de Buenos Aires and Ministerio de Ambiente de la Nación.

Hisoil has formal and regular processes for gathering information from stakeholders (focus groups, surveys, community meetings, etc.) and has not received any negative feedback from them so far, in the other hand, is focusing in improving the positive impact in the community, the axes of the social policies are:

As shared before, Hisoil takes and active role to promote sustainability and also gets direct feedback from National authorities by organizing meetings in the premises, with Universities and National Institutes by receiving students and teachers and collaborating with an agreement in future projects to improve the processes of composting. All theses meetings and visits gives Hisoil the opportunity to get feedback and to improve the positive impact and correct any negative one.

The company implemented a meeting with local authorities and neighbours to get different their complaints and suggestions, comiGiven the situations referred to in the

previous point, Hisoil is highly regarded in its region due to the work it does to reduce environmental impact, and the need to have a plant of this nature in the region. Also is well considered at national level for its collaboration an expertise, and is also well considered by different universities and institutions for the same reason. Therefore, by the surrounding municipalities, at the provincial and national level, the company has been encouraged to follow this path and continue with investments for new projects in the fight against climate change, which entails, in its main objectives, Health and Well-being, Quality Education, Gender Equality, Decent Work and Economic Growth, Renewal Industry and Infrastructure, Sustainable Cities and Communities, Responsible Consumption and Production and finally Climate Action.ng from these meetings, Hisoil took the initiative to improve the road that goes to the premises and is taking all corrective actions needed to avoid any problem for the rest of the users of the road.

The company has as well a complaints and suggestions mailbox for the workers to get their feedback and the ideas.

The company maintains its way of working and continuously improves his contribution against climate change, investing in technology to achieve its objectives; And the most important thing is that to date the company has no complaints from the neighboring population regarding the treatments it carries out without generating odors, which brings about social unrest.

11 REDD+ Safeguards

Not applicable because it's not a REDD+ project.

12 Special categories, related to co-benefits

Not applicable because the project is not a special category.

13 Implementation of the project

13.1 Implementation status of the project

1. *The starting date of operation of the project and, the operation of the project activities during this monitoring period. The description shall include any*

information on events that may impact the GHG emission reductions or removals and monitoring;

The starting date of operation of the project is 01/08/2019. There were no events that could impact the reductions or removals of GHG emissions and their monitoring during this monitoring period (since 01/08/2019 to 31/07/2023).

2. *For project activities that consist of more than one site, the report shall clearly describe the status of implementation and starting date of operation for each site;*

Not applicable because the project is not in more than one site.

3. *The information regarding the actual operation of the project during this monitoring period, including information on special events, for example overhaul times, downtimes of equipment, exchange of equipment, etc.;*

There were no special events during this monitoring period.

4. *A brief description of: (i) events or situations that occurred during the monitoring period, which may impact the applicability of the methodology, and (ii) how the issues resulting from these events or situations are being addressed.*

There were no special events, situations or issues during this monitoring period.

13.2 Changes after the GHG project registration

13.2.1 Temporary deviations

There are no temporary derivations after the GHG project registration.

13.2.2 Permanent Changes

13.2.2.1 Corrections

There are no permanent changes after the GHG project registration.

13.2.2.2 Permanent changes to the monitoring plan, BCR program methodologies in use, or other regulatory documents related to BCR program methodologies.

There are no permanent changes after the GHG project registration.

13.2.2.3 Changes to GHG project design

There are no permanent changes after the GHG project registration.

14 Grouped Projects

Not applicable because it's not grouped project.

15 Monitoring system

15.1 Description of the monitoring plan

This monitoring plan is designed to meet different requirements established by the BCR Standard, BCR Tools and the applied methodology. It is worth mention that the monitoring plan is covered in a big part by other procedures like the environmental management system, safety and security protocols and quality controls that make sure that all the legislative and administrative requirements are fulfilled and also allow the project to be more efficient, detect possible problems or threats and implement contingency and improvement plans when required in addition to enable all the GHG calculations required.

Description of the monitoring plan

The following diagram shows the project monitoring actions and explains them below.

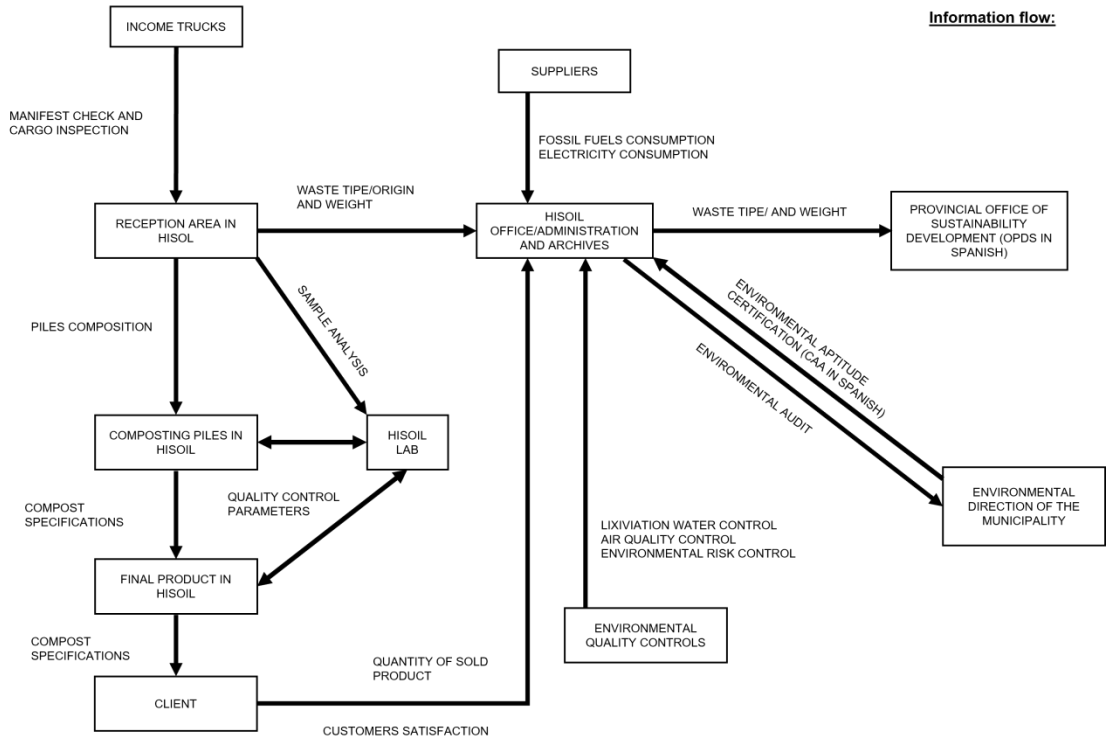

Figure 5. Information flow of Hisoil's project.

Once the income trucks get into Hisoil installations the manifests where it specifies the origin, type and weight of the wastes transported are checked. There is also a visual verification that the cargo corresponds with the manifest information. All the accepted cargo are transported to the reception area.

Once in the reception area the manifest information is sent to the office and administration of the company both for storage and control and also because the information regarding type and weight of all the wastes admitted and treated in the company must be sent to the OPDS (Provincial Office of Sustainability Development in Spanish).

For the assembly of the composting piles and the composting process itself there is a constant communication between the laboratory and the operators. Samples are taken and analyse to ensure that they meet the parameters required to be composted. Composting piles also have a particular mix of types of wastes that are controlled and verified. During the maturation process, relevant data like temperature, humidity, conductivity and pH are controlled by the lab to monitored the evolution of the composting process.

Once the process is completed, the characteristics of the final product are determined by laboratory analysis and specified to be separated by quality and make this information available for the customers and clients. Customers and clients also have channels available to give feedback about the level of satisfaction with the product that they have received and any other suggestion or complaint that they see fit or relevant to notify. All this information is received in the office and storage to control both sales and quality controls.

For both the internal cargo movement, piles assembly and all the other process carried out within the Hisoil plant, trucks are contracted. The supplier of the trucks sends information about both the number of hours of service provided and also de amount of fossil fuels consumed. The other main source of energy needed to carry out Hisoil's activity is electricity which is provided by a supplier that specifies the amount of electricity consumed. All this information is storage and control in the office and administration for its relevance with the economic and financial state of the company.

In order to fulfil the obligations of the company with the Environmental Direction of the Municipality an annual renovation of the CAA (Environmental Aptitude Certification in Spanish) is required. This renovation depends on the result of an Environmental Audit that is also annually conducted by an authorised third part. This audit checks the process, installations, safety and labour conditions, fire and environmental risks and also specific parameters regarding both air and water quality controls. There are several environmental quality control stations (three to measure air quality and four phreatic wells for water quality) that periodically measures the required parameters and their results are storage by the office and administration to provide with this relevant information both to an extern laboratory to verified the information and the environmental auditor.

a) Responsibility in the monitoring plan

The monitoring plan will be carried out as set out below in this document. The person in charge of general management of Hisoil will be primarily and ultimately responsible for maintaining the quality of the data collected and ensuring that each part of the project complies with the established plan. Nevertheless, the distribution of responsibilities for the monitoring plan is as follows:

- Main responsible: the person in charge of general management of Hisoil.

- Reception area in Hisoil: responsible of providing the quantity of waste.

- Administration (Hisoil office):

    - Responsible of the reception and checking the weigh and type of waste and send it to Provincial Office of Sustainability (OPDS).

    - Responsible of the results of environment audit to Environmental Direction of the Municipally and to receive the environmental aptitude certification (CAA).

    - Responsible of the relations with stakeholders.

- Hisoil lab:

    - Responsible of quality of the waste received and the final product sold.

    - Responsible of carrying out environmental analyses.

b) Monitoring periods

The project holder will ensure that annual monitoring of all data and process is carried out correctly. The quality of data will be validated and verified as it's been exposed before.

The management of GHG emission reductions is based on data that will be carried out following BCR Standard, every three years. As the project is a retroactive project, the first period's been already validated and verified. The next periods of validation and verification are from 01/08/2023 to 31/07/2026 and since 01/08/2026 to 31/07/2029.

c) Data recording and archiving system

All information regarding waste and residue entrance as well as compost produce and sell is adequately preserved in a physical archive.

All information coming from suppliers, clients and any other part intervening in the project activity is also preserved. Records of the amount of waste treated are also facilitated to the Provincial Office of Sustainability Development (OPDS in Spanish) where they kept records of the type and quantity of wastes treated.

In order to improve the efficiency of the recording and archiving system, a digitalization process has already started to keep both a physical and on-line registries of the data parameters and information regardless the entire monitoring plan and all the compatible procedures (environmental, safety and quality control procedures, etc.).

Although the company does manage animal manure, the required data to properly apply the calculations specified by the methodology have not been properly collected so far, therefore to ensure data traceability and reduce uncertainty it has not been included in the project. Although, manure is not considered at this stage Hisoil is working to improve and adapt data collection and sampling plans to effectively incorporate it in future measurements.

d) Quality control for the monitoring plan

As specified in the BCR Tool "Monitoring, Reporting and Verification"(MRV), as part of the process of designing the monitoring plan, the following principles have been applied to ensure the quality of the monitoring plan:

Accuracy: minimizing bias and uncertainty in the measurement and processing of quantitative and nonquantitative data; reducing sources of uncertainty; and maintaining, calibrating, and checking all metering or other testing equipment used to report monitoring data for guidance on equipment calibration and ensuring that spreadsheets and other tools used to store and manipulate monitoring data are free from error.

Relevance: the monitoring and reporting of emission reductions achieved by the project is relevant information and complies with the BCR STANDARD.

Credibility: information is authentic and believable relative to what is being measured.

Reliability: information will be able to yield the same results on a repeated basis over time using the same monitoring method and data.

Completeness: all relevant information for all relevant sources of data that are required for the assessment of emission reductions are included.

Consistency: data, methods, criteria, and assumptions allow meaningful and valid comparisons of the greenhouse gas emission reductions achieved in different monitoring periods and/or by different projects.

Transparency: information will be made publicly available to allow reviewers to make decisions on the credibility and reliability of greenhouse gas emission reduction claims with reasonable confidence.

Project monitoring

Below are explained all the quality controls that will be carried out in relation to the project activities and its correctly development.

(a) Project boundary monitoring

The project boundary is defined as the physical, geographical location of the following:

- The reception area where the accepted waste is temporarily stocked.
- The composting facility, where the treatment of biomass through composting takes place.
- The areas where the compost is storage until sale.
- The lixiviating pools system used to water the compost piles.
- The transports within the facilities of waste and compost during the regular organization operations.

As part of the usual operation of the installations, the project boundary monitoring consists of a surveillance and control service that controls that there are no interferences with regular activity by any external or uncontrolled element within the project boundary.

(b) Monitoring of the execution of project activities

To ensure a correct execution of the project activities there are a few significant aspects that will be monitored:

Parameter	Monitorization action
Income and cargo control	- Manifest check: this document includes the type of residue (always non-hazardous) and weight control. Weight control will be ensured by the provider with his own scale or by providing with a public scale ticket specifying the cargo weigh. - Visual inspection: visual inspection of the cargo to compare it with the manifest information. - Lab analysis: if there is any doubt about the nature of the residue a lab analysis is conducted to determine its suitable for composting.
Compost piles control	- Humidity field test: samples are manually taken from the piles taken three samples from different parts of the pile from 20-30 cm in depth. If the sample remains aggregated water is not required, but if the sample disaggregates water is added.

	- Odour test: once a week an odour test is conducted and if the result is positive, the pile will be flipped to ensure a correct oxygenation of the compost.
Internal truck movement	- Suppliers' information on the total amount of hours with truck functioning within the installations.

(c) Quality control of project activities

To ensure the quality of the project activities, all actions carried out are double-checked:

- The waste reception manifest is verified both upon reception and in the office and with the OPDS.

- The quality of the waste is analysed again in the laboratory

- The environmental impact of the project is certified with the CAA.

Monitoring of data and information necessary to estimate and calculate GHG reduction and methodology

Below are explained all the quality controls that will be carried out in relation to the estimation and calculations of GHG reductions and the methodology applied.

(a) Monitoring of the quantification of project emission reduction/removals

Project emission is due to both fuel and electricity consumption as well as the emissions from the composting process itself. The project emissions have been calculated based on the amount of solid waste received by the project holder because the monitored data is not available. Nevertheless, Hisoil is working on the monitoring of fossil fuel and energy consumption in aim to improve the efficiency of the calculations and results.

Parameter	Monitorization action
Fuel consumption reduction	- Monitoring and periodic control of compost piles to adjust the use of machinery use to flip the piles and that way minimizing the emissions from trucks movement and machinery. - Number of flips and hours of use of the trucks and machinery base on internal records and suppliers provided information.

Energy efficiency	- Consumption of electricity based on suppliers' information.

(b) Description of established procedures for periodic calculation of GHG emission reductions or removals and leakage;

The project's reductions will be calculated following the last version of CDM methodology AMS-III.F, and all of its tools. So, the project holder will ensure that the tools, methodologies and standards are updated in their last version before every calculation. The calculation of emission reductions will be done every three years, as the monitoring period establishes.

(c) Applicability conditions of the methodology

Following the applied methodology, AMS.III.F, there are some applicability conditions that must be monitored to ensure the GHG removals can be calculated, as it's mentioned in section 3.1.1. of this PDD. Below are explained the applicability conditions that must be monitored.

1. Quality of the compost generated

In para 33 of AMS.III-F "The operation of composting facilities shall be documented in a quality control program, monitoring the conditions and procedures that ensure the aerobic condition of the waste during the composting process (e.g. temperature and moisture during different composting stages)". To ensure compliance with this condition, there are a quality control and assurance procedures to ensure the quality of the compost generated, this procedure consists in a laboratory analysis to meet the following criteria:

- pH between 5.5 - 7.5.
- Conductivity minor o equal to 2.5.
- Germination: after seven days a germination level of stem and root between 3 – 5.
- Temperature between 25 - 30ºC.

Depending on the parameters, there are three types of different quality compost produce:

Analysis	Compost A	Compost B	Compost C
pH	6.5 – 7.2	7.2 – 7.7	> 7.7
Conductivity	< 1.5	1.5-2.5	> 2.5

Organic matter content	> 30 %	25 - 30 %	< 25 %
Odour	Wet soil	Wet soil	Wet soil
Colour	Dark brown	Dark brown	Dark brown
Germination	> 90 %	80 - 90 %	< 80 %

Also, in para 34 of AMS.III.F, "Soil application of the compost in agriculture or related activities will be monitored". As part of Hisoil's standardized procedure, the sale of compost as a final product is documented. To ensure the quality of the final product, Hisoil's laboratory makes analysis of humidity, odor, pH, temperature and connectivity. This procedures ensures the quality of the compost final product. Once sold, Hisoil has an process to verify the correct application to the soil carried out by the final buyers. Hisoil is close to its buyers by establishing quality protocols and, as Customer Satisfaction Procedure establishes, Hisoil has an open communication channel through the contacts with the commercial department, web and social media. The objective of these is the determination of the degree of satisfaction and perception regarding the degree of compliance with respect to the services provided. All comments are analysed and shared in an internal group called "Reclamo de Calidad, in spanish" and decisions and solutions are taking to solve any issue related with the quality of the service or the quality of the products, for the current customers and for the future ones. This group ensure and verify the proper soil application. The quality of the final product and the studies made by AACS (Asociación Argentina de Ciencia del Suelo, in spanish), ensure that the application of this kind of compost (with the same characteristics) is perfect to maintain soil fertility and health.

2. Project boundary

As established in the applicability conditions of the methodology AMS.III.F, the project cannot exceed 200 km in radius. Hence, as mentioned before, the location of the waste generators will be carried out every time a new operator wants to work with Hisoil, being an essential condition to be one of our suppliers.

(d) Verification of field data

All information regarding the result of analysis and is double checked between operators and the lab responsible person. The idea behind this double verification process is to ensure that there is a constant correlation between the operation within the installations

and the monitoring and control parameters registered. These parameters include the compost pile controls, income and cargo control and amount of compost generated.

All data recovered and verification system is annually audited as part of the process to renovate the Environmental Annual Authorisation (CAA in Spanish) required to operate waste treatment projects in Argentina.

(e) Review of information processing

All data recovered and verification system is annually audited as part of the process to renovate the Environmental Annual Authorisation (CAA in Spanish) required to operate waste treatment projects in Argentina.

This Environmental Audit also verifies the waste treatment protocol, air and water quality control, safety procedures, legislation and administrative compliance and the adequacy of the Environmental management system in place.

(f) Data and information needed to estimate GHG emission removals or reductions during the project quantification period

The monitoring plan is designed to ensure that both, the project process and all the data required to calculate the GHG mitigation, are constantly updated and allow the project to be more efficient, detect possible problems or threats and implement contingency and improvement plans when required.

As per para 29 of the methodology AMS-III.F establishes, the monitoring methodology "in the case of construction of new composting facilities or expansion of capacity of existing composting facilities, the emission reduction achieved by the project activity will be measured as the difference between the baseline emission and the sum of the project emission and leakage: $ER_y = BE_y + (PE_y + LE_y)$". This is the equation used to calculate the emission reduction of the project and all the datas and parameters monitored are included in section 16. In any case, in order to keep the information updated, the following parameters and its sources will be monitored:

- Emission factors: fore the determination of the project emissions and reductions, it's necessary to keep this parameter updated taking into account standardized values:
    - Emission factor for electricity generation for source j in year y ($EF_{EF,j,y}$). Official source: Government of Argentina.
    - Default emission factor for fossil fuels consumed by the composting activity per tonne of waste ($EF_{FC,default}$). Official source: Methodological tool number 13 "Project and leakage emissions from composting", version 02.0.

- Emission factor of methane per tonne of waste composted valid for year y. ($EF_{CH4,y}$). Official source:Methodological tool 13 “Project and leakage emissions from composting” version 2.0.

- Emission factor of nitrous oxide per tonne of waste composted valid for year y ($EF_{N2O,y}$). Official source. Methodological tool 13 “Project and leakage emissions from composting” version 2.0.

- Global Warming Potential of different GHG.

  - Global Warming Potential of nitrous oxide (GWP_{N2O}). Official source: Global Warming Potential Values - Greenhouse Gas Protocol, adapted from the IPCC Fifth Assessment Report, 2014 (AR5).

  - Global Warming Potential of Methane(GWP_{CH4}). Official source: Global Warming Potential Values - Greenhouse Gas Protocol, adapted from the IPCC Fifth Assessment Report, 2014 (AR5).

- Default values: for the determination of the project emissions and reductions, it’s necessary to keep this parameter updated taking into account standardized values:

  - Default value for the specific quantity of electricity consumed per tonne of waste composted ($SEC_{comp,default}$). Official source: Methodological tool number 13 “Project and leakage emissions from composting”, version 02.0.

  - Average technical transmission and distribution losses for providing electricity to source j in year y ($TDL_{j,y}$). Official source: The World Bank Stadistics.

- Data and parameters monitored:

  - Amount of solid waste type j prevent from disposal in the SWDS in year x (for baseline, $W_{j,y}$) and Quantity of waste composted in year y (for project emission, Q_j). Source: measurements by project holder.

(g) Data and additional information to establish the baseline or reference scenario

In order to keep the information updated, the following parameters and its sources will be monitored:

- Default values: for the determination of the project emissions and reductions, it’s necessary to keep this parameter updated taking into account standardized values:

  - Default value for the model correction factor to account for model uncertainties for year y (ϕ_y). Official source: Methodological tool 4 “Emission from solid waste disposal sites” version 08.1.

- Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emissions of methane to the atmosphere in year y (f_y). Official source: Methodological tool 4 “Emission from solid waste disposal sites” version 08.1.

- Oxidation factor (OX). Official source: Based on an extensive review of published literature on this subject, including the IPCC 2006 Guidelines for National Greenhouse Gas Inventories and Methodological tool 4 “Emission from solid waste disposal sites” version 08.1.

- Fraction of methane in the SWDS gas (F). Official source: Methodological tool 4 “Emission from solid waste disposal sites” version 08.1. and IPCC 2006 Guidelines for National Greenhouse Gas Inventories.

- Fraction of degradable organic carbon ($DOC_{f,y}$) that decomposes under the specific conditions occurring in the SWDS for year y. Official source: Methodological tool 4 “Emission from solid waste disposal sites” version 08.1. and IPCC 2006 Guidelines for National Greenhouse Gas Inventories.

- Methane correction factor for year y (MCF_y). Official source: Methodological tool 4 “Emission from solid waste disposal sites” version 08.1. and IPCC 2006 Guidelines for National Greenhouse Gas Inventories.

- Fraction of degradable organic carbon in the waste type j (weight fraction) (DOCj) Official source: Methodological tool 4 “Emission from solid waste disposal sites” version 08.1. and IPCC 2006 Guidelines for National Greenhouse Gas Inventories.

- Decay rate for the waste type j (1/yr) (k_j). Official source: Methodological tool 4 “Emission from solid waste disposal sites” version 08.1. and IPCC 2006 Guidelines for National Greenhouse Gas Inventories.

- Data and parameters monitored:

  - Amount of solid waste type j prevent from disposal in the SWDS in year x (for baseline, $W_{j,y}$) and Quantity of waste composted in year y (for project emission, Q_j). Source: measurements by project holder.

(h) Specification of any potential emissions that would occur outside the project boundary as a result of GHG project activities (leakage).

Not applicable because there is no leakage in this project.

15.2 Data and parameters to quantify the reduction of emissions

15.2.1 *Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors*

<table>
<tr><td>Data / Parameter</td><td>$EF_{EF,j,y}$</td></tr>
<tr><td>Data unit</td><td>t CO_2/MWh</td></tr>
<tr><td>Description</td><td>Emission factor for electricity generation for source j in year y</td></tr>
<tr><td>Source of data used</td><td>Methodological tool 5 “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation“(version 3).</td></tr>
<tr><td>Value (s)</td><td>The emission factor for electricity generation are:
<table>
<tr><th><u>Year</u></th><th>$EF_{EF,j,y}$ (t CO_2e/MWh)</th></tr>
<tr><td>2019</td><td>0.267</td></tr>
<tr><td>2020</td><td>0.275</td></tr>
<tr><td>2021</td><td>0.292</td></tr>
<tr><td>2022</td><td>0.2717</td></tr>
<tr><td>2023</td><td>0.231</td></tr>
</table>
So, values applied $EF_{EF,j,y}$ for each period are an average of each year:
<table>
<tr><th><u>Year</u></th><th>$EF_{EF,j,y}$ (t CO_2e/MWh)</th></tr>
<tr><td>01/08/19-31/07/20</td><td>0.271</td></tr>
<tr><td>01/08/20-31/07/21</td><td>0.2835</td></tr>
<tr><td>01/08/21-31/07/22</td><td>0.28185</td></tr>
</table>
</td></tr>
</table>

	01/08/22-31/07/23	0.25135
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Determination of the project emissions.	
Justification of choice of data or description of measurement methods and procedures applied	Based on the information from the Argentine Government: https://www.argentina.gob.ar/economia/energia/energia-electrica/estadisticas ;https://cammesaweb.cammesa.com/download/factor-de-emision/, the emission factor is an average of each year for the period.	
Additional comments	-	

Data / Parameter	**$TDL_{j,y}$**
Data unit	-
Description	Average technical transmission and distribution losses for providing electricity to source j in year y
Source of data used	IEA Statistics OECD/IEA 2018.
Value (s)	15%
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Determination of the project emissions
Justification of choice of data or description of measurement methods and procedures applied	Based on The World Bank statistics (IEA), the electric power transmission and distribution losses (% of outputs) in Argentina is 15% https://data.worldbank.org/indicator/EG.ELC.LOSS.ZS
Additional comments	

Data / Parameter	**$SEC_{comp,default}$**
Data unit	MWh/t
Description	Default value for the specific quantity of electricity consumed per tonne of waste composted
Source of data used	Methodological tool number 13 “Project and leakage emissions from composting”, version 02.0.
Value (s)	0.01
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Determination of the project emissions
Justification of choice of data or description of measurement methods and procedures applied	Based on Data /Parameter table 4 of he methodological tool number 13.
Additional comments	

Data / Parameter	**$EF_{FC,default}$**
Data unit	Tons of CO_2 per tonne of waste (tCO_2e/t)
Description	Default emission factor for fossil fuels consumed by the composting activity per tonne of waste
Source of data used	Methodological tool number 13 “Project and leakage emissions from composting”, version 02.0.
Value (s)	0.0207

Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Determination of the project emissions
Justification of choice of data or description of measurement methods and procedures applied	As per Data /Parameter table 5 of he methodological tool number 13.
Additional comments	

Data / Parameter	**$EF_{CH4,y}$**
Data unit	t CH_4 / t
Description	Emission factor of methane per tonne of waste composted valid for year y.
Source of data used	Methodological tool 13 “Project and leakage emissions from composting” version 2.0.
Value (s)	0.002
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Determination of the project emissions.
Justification of choice of data or description of measurement methods and procedures applied	As per table 2, page 11 from the tool, $EF_{CO4,y}$ (option 2) is a default value. The emission factor was selected based on studying the published results of emission measurements from composting facilities, literature reviews on the subject and published emission factors. Data from recent, high quality sources was analyzed and a value conservatively selected from the higher end of the range results.
Additional comments	

Data / Parameter	**$EF_{N2O,y}$**
Data unit	t N_2O/ t
Description	Emission factor of nitrous oxide per tonne of waste composted valid for year y
Source of data used	Methodological tool 13 “Project and leakage emissions from composting” version 2.0.
Value (s)	0.0002
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Determination of the project emissions.
Justification of choice of data or description of measurement methods and procedures applied	As per table 3, page 12 from the tool, EFN_2O,y (option 2) is a default value. The emission factor was selected based on studying the published results of emission measurements from composting facilities, literature reviews on the subject and published emission factors. Data from recent, high-quality sources was analyzed and a value conservatively selected from the higher end of the range results.
Additional comments	

Data / Parameter	**GWP_{N2O}**
Data unit	t CO_2e/t N_2O
Description	Global Warming Potential of nitrous oxide.
Source of data used	Global Warming Potential Values - Greenhouse Gas Protocol, adapted from the IPCC Fifth Assessment Report, 2014 (AR5).

Value (s)	265.00
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Determination of the project emissions.
Justification of choice of data or description of measurement methods and procedures applied	Global warming potential of nitrous oxide valid for the relevant commitment period: https://ghgprotocol.org/sites/default/files/Global-Warming-Potential-Values%20(Feb%2016%202016)_1.pdf
Additional comments	

Data / Parameter	**y**
Data unit	year
Description	Year of the crediting period for which methane emissions are calculated (y is a consecutive period of 12 months)
Source of data used	Standard BCR app 11.5
Value (s)	10
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Determination of the baseline and project emissions.
Justification of choice of data or description of measurement methods and procedures applied	The crediting period for “energy, waste and other” product use projects is 10 years: since 01/08/2019 to 31/07/2029.
Additional comments	

Data / Parameter	ϕ_y
Data unit	-
Description	Default value for the model correction factor to account for model uncertainties for year y.
Source of data used	Methodological tool 4 “Emission from solid waste disposal sites” version 08.1.
Value (s)	0.85
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Determination of the baseline and project emissions.
Justification of choice of data or description of measurement methods and procedures applied	As per table 2 (page 7) and Data /Parameter table 1 (page 13) of the tool, the default value is applied to application B and in humid/wet conditions, based on Argentines climate, where the SWDS is located.
Additional comments	

Data / Parameter	f_y
Data unit	-
Description	Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emissions of methane to the atmosphere in year y.
Source of data used	Methodological tool 4 “Emission from solid waste disposal sites” version 08.1.
Value (s)	0

Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Determination of the baseline.
Justification of choice of data or description of measurement methods and procedures applied	For application B,as per Data / Parameter table 10, the monitoring must be annually: select the maximum value from the following: (a) contract or regulation requirements specifying the amount of methane that must be destroyed/used (if available) and (b) historic data on the amount captured. As the methane doesn't have to be destroyed and there's no regulation requirements, $f_y = 0$.
Additional comments	

Data / Parameter	**GWP_{CH4}**
Data unit	t CO_2e/t CH_4
Description	Global Warming Potential of methane.
Source of data used	Global Warming Potential Values - Greenhouse Gas Protocol, adapted from the IPCC Fifth Assessment Report, 2014 (AR5).
Value (s)	28.00
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Determination of the baseline and determination of the project emissions.
Justification of choice of data or description of measurement methods and procedures applied	Global warming potential of methane valid for the relevant commitment period. https://ghgprotocol.org/sites/default/files/Global-Warming-Potential-Values%20(Feb%2016%202016)_1.pdf
Additional comments	

Data / Parameter	**OX**
Data unit	-
Description	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)
Source of data used	Based on an extensive review of published literature on this subject, including the IPCC 2006 Guidelines for National Greenhouse Gas Inventories and Methodological tool 4 “Emission from solid waste disposal sites” version 08.1.
Value (s)	0.10
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Determination of the baseline
Justification of choice of data or description of measurement methods and procedures applied	As per table 2 (page 7) and Data / Parameter table 2 (page 14), for applications A and B, the default value of OX is 0.1.
Additional comments	

Data / Parameter	**F**
Data unit	-
Description	Fraction of methane in the SWDS gas (volume fraction).
Source of data used	Methodological tool 4 “Emission from solid waste disposal sites” version 08.1. and IPCC 2006 Guidelines for National Greenhouse Gas Inventories.
Value (s)	0.5

Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Determination of the baseline.
Justification of choice of data or description of measurement methods and procedures applied	As per table 2 (page 7) and Data /Parameter table 3 (page 14), for applications A and B, the default value of F is 0.5.
Additional comments	

Data / Parameter	**$DOC_{f,y}$**
Data unit	weight fraction
Description	Fraction of degradable organic carbon (DOC) that decomposes under the specific conditions occurring in the SWDS for year y.
Source of data used	Methodological tool 4 “Emission from solid waste disposal sites” version 08.1. and IPCC 2006 Guidelines for National Greenhouse Gas Inventories.
Value (s)	0.5
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Determination of the baseline.
Justification of choice of data or description of measurement methods and procedures applied	As per para 18, table 2, for application B, and Data /Parameter table 4 (pages 14-15) in the case of MSW, default value is established by IPCC Guidelines for National GGI.
Additional comments	

Data / Parameter	**MCF_y**
Data unit	-
Description	Methane correction factor for year y
Source of data used	Methodological tool 4 “Emission from solid waste disposal sites” version 08.1. and IPCC 2006 Guidelines for National Greenhouse Gas Inventories.
Value (s)	1.00
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Determination of the baseline.
Justification of choice of data or description of measurement methods and procedures applied	As per para 18, table 2, for application B, considering SWDS without a water table above the bottom of the SWDS, the default value (based on SWDS type) for MCF_y is 1, as per Data /Parameter table 5 (page 15), for anaerobic managed solid waste disposal sites.
Additional comments	

Data / Parameter	**DOC_j**
Data unit	-
Description	Fraction of degradable organic carbon in the waste type j (weight fraction)
Source of data used	Methodological tool 4 “Emission from solid waste disposal sites” version 08.1. and IPCC 2006 Guidelines for National Greenhouse Gas Inventories.
Value (s)	As the value depends on the waste type, the values applied are above:

<table>
<tr><td></td><td>
<table>
<tr><th>Waste type</th><th>DOC_j</th></tr>
<tr><td>Wood and wood products</td><td>43%</td></tr>
<tr><td>Pulp, paper and cardboard (other than sludge)</td><td>40%</td></tr>
<tr><td>Food, food waste,
beverages and tobacco
(other than sludge)</td><td>15%</td></tr>
<tr><td>Garden, yard and park
waste</td><td>20%</td></tr>
<tr><td>Sewage sludge</td><td>5%</td></tr>
<tr><td>Other putrescible</td><td>20%</td></tr>
</table>
</td></tr>
<tr><td>Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)</td><td>Determination of the baseline.</td></tr>
<tr><td>Justification of choice of data or description of measurement methods and procedures applied</td><td>As the value depends on the waste type, justifications of each data are above:
<table>
<tr><th>Waste type</th><th>Justification</th></tr>
<tr><td>Wood and wood products</td><td>For application B, and data / parameter table 6, Methodological tool 004 “Emissions from solid waste disposal sites”.</td></tr>
<tr><td>Pulp, paper and cardboard (other than sludge)</td><td>For application B, and data / parameter table 6, Methodological tool 004 “Emissions from solid waste disposal sites”.</td></tr>
</table>
</td></tr>
</table>

	Food, food waste, beverages and tobacco (other than sludge)	For application B, and data / parameter table 6, Methodological tool 004 “Emissions from solid waste disposal sites”.
	Garden, yard and park waste	For application B, and data / parameter table 6, Methodological tool 004 “Emissions from solid waste disposal sites”.
	Sewage sludge	According to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, industrial wastewater may be treated on site or released into domestic sewer systems. As specified in in Chapter 6, in the section 2.3, when the residue is released into the domestic sewer system, the emissions are to be included with the domestic wastewater emissions. Sludge from domestic and industrial wastewater treatment plants is addressed in Chapter 2 in the section 2.2, where it is established that default values for degradable organic carbon content in sludge are given in Section 2.3 Waste Composition, in the same chapter that determines that for domestic sludge, the default DOC value (as percentage of wet waste assuming a default dry matter content of 10 percent) is 5 percent (range 4-5 percent, which means that the DOC content would be 40-50 percent of dry matter). These

		criteria are the same indicated in the Data/Parameter tables 6 and 7 of the Tool 04 "Methodological tool: Emissions from solid waste disposal sites".
	Other putrescible	According to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 5, Chapter 3, this value depends on the type of waste and its grade of degradation. These criteria are the same as in Data / Parameter tables 6 and 7 of the methodological tool 004 "Emissions from solid waste disposal sites". So, the of for other (non-food) organic putrescible garden and park waste is the same as the value for garden and park waste because of their grade of degradation.
Additional comments		

Data / Parameter	$\mathbf{k_j}$
Data unit	1/yr
Description	Decay rate for the waste type j (1/yr)
Source of data used	Methodological tool 4 "Emission from solid waste disposal sites" version 08.1. and IPCC 2006 Guidelines for National Greenhouse Gas Inventories.
Value (s)	As depends on the waste type, the applied values are:

<table>
<tr><td></td><td>
<table>
<tr><th>Waste type</th><th>k_j</th></tr>
<tr><td>Wood and wood products</td><td>0.03</td></tr>
<tr><td>Pulp, paper and cardboard (other than sludge)</td><td>0.06</td></tr>
<tr><td>Food, food waste, beverages and tobacco (other than sludge)</td><td>0.185</td></tr>
<tr><td>Garden, yard and park waste</td><td>0.10</td></tr>
<tr><td>Sewage sludge</td><td>0.185</td></tr>
<tr><td>Other putrescible</td><td>0.10</td></tr>
</table>
</td></tr>
<tr><td>Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)</td><td>Determination of the baseline.</td></tr>
<tr><td>Justification of choice of data or description of measurement methods and procedures applied</td><td>Considering Data / Parameter table 7 of the methodological tool, since the project is in a boreal and temperate (MAT ≤ 20ºC), Wet (MAP/p ET > 1), location, values depend on the waste type:
<table>
<tr><th>Waste type</th><th>Justification</th></tr>
<tr><td>Wood and wood products</td><td>For application B, and data / parameter table 7, Methodological tool 004 “Emissions from solid waste disposal sites”.</td></tr>
<tr><td>Pulp, paper and cardboard (other than sludge)</td><td>For application B, and data / parameter table 7, Methodological tool 004 “Emissions from solid waste disposal sites”.</td></tr>
</table>
</td></tr>
</table>

	Food, food waste, beverages and tobacco (other than sludge)	For application B, and data / parameter table 7, Methodological tool 004 “Emissions from solid waste disposal sites”.
	Garden, yard and park waste	For application B, and data / parameter table 7, Methodological tool 004 “Emissions from solid waste disposal sites”.
	Sewage sludge	Based on the criteria indicated on data /parameter 9 of these document (DOC). These criteria are the same indicated in the Data/Parameter table 7, of the Tool 04 “Methodological tool: Emissions from solid waste disposal sites”.
	Other putrescible	Based on the criteria indicated on data /parameter 8 of these document (DOC). This criteria are the same as in Data / Parameter table 7 of the methodological tool 004 .
Additional comments		

15.2.2 Data and parameters monitored

Data / Parameter	**$W_{j,x}$ or Q_j**
Data unit	tonnes (t)

Description	Amount of solid waste type j prevent from disposal in the SWDS in year x (for baseline, $W_{j,y}$) and Quantity of waste composted in year y (for project emission, Q_j). As per Data / parameter table 11 (page 19) of the methodological tool 4 "Emissions from solid waste disposal sites", version 08.1:, for application B this parameter is the total amount of waste disposed in a SWDS in year x and its data source is the measurements of the project holder. According to paragraph 14 of the methodological tool 13 "Project and leakage emission from composting", option 1, the composting installation monitor the weight of waste delivered using an on-site weighbridge or any other applicable and calibrated weighing device. So, Q_y and W_j has the same values.
Measured /Calculated /Default:	Measured by the project holder
Source of data	Measured by the project holder

Value(s) of monitored parameter	Waste (Wj) (ton)	Garden, yard and park	Food, food waste, beverages and tobacco (other than sludge)	Food waste/ Sewage sludge	Other organic putrescible (non food)	Pulp, paper, cardboard...	Wood, wood product	Total (ton)
	01/08/19-31/07/20	1,093.30	1,925.15	13,073.49	1,551.01	36.73	0.00	17,679.67
	01/08/20-31/07/21	2,254.74	6,318.63	19,278.18	777.93	176.83	11.86	28,818.17
	01/08/21-31/07/22	2,036.20	5,368.92	20,975.43	663.68	243.22	72.30	29,359.75
	01/08/22-31/07/23	2,288.21	6,813.85	27,735.95	232.51	400.19	0.00	37,470.71
	Total	7,672.44	20,426.55	81,063.05	3,225.13	856.97	84.16	113,328.30
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Determination of the baseline and determination of the project emission.							

<table>
<tr><td>Monitoring equipment</td><td>Monitored continuously with the entrance of each truck at the plant. Waste quantity has been determined by the delivery notes, cargo manifest and documents of entry of the trucks into Hisoil's facilities. All these documents have been collected and each waste income has been cataloged in the different waste type category (following IPCC 2006 Guidelines for National Greenhouse Gas Inventories). The determination of the waste type is based on the official LER code (Lista Europea de Residuos, in spanish; "European Waste List") and the specifications of the waste provider, which are verified by the project holder while performing the cargo control.</td></tr>
<tr><td>Measuring/ Reading/ Recording frequency</td><td>Daily</td></tr>
<tr><td>Calculation method (if applicable)</td><td>Not applicable</td></tr>
<tr><td>QA/QC procedures applied</td><td>To ensure data quality under ISO 14064-2 and the requirements of the selected methodology, Hisoil has implemented a checklist procedure that must be completed for each accreditation period:
<table>
<tr><th>CC Activity</th><th>Procedure to be performed</th><th>Comply</th><th>Comments</th></tr>
<tr><td>Review that assumptions and criteria for selecting activity data and emission factors are documented.</td><td>• Compare activity data descriptions and emission factors with information on source categories and ensure they are recorded and archived correctly.</td><td>Correct</td><td>-</td></tr>
</table></td></tr>
</table>

	Review data entries and references for transcription errors.	Confirm that bibliographic data references are correctly cited in internal documentation. Compare a sample of input data from each source category (measurements or parameters used in calculations) to see if there are transcription errors.	Confirmed	All parameters and it's sources have been revised.
	Check that the baseline and project scenario emissions have been calculated correctly.	Reproduce a representative sample of emissions reduction calculations. Selectively mimic complex model calculations with abbreviated calculations to judge their relative accuracy.	Correct.	All the calculations have been revised and checked by the project holder in different scenarios.
	Check that the emission parameters and units are recorded correctly and that appropriate conversion	Check that the units are properly labeled on the spreadsheets. Check that the units are carried correctly from the beginning to the end of the calculations. Check that the conversion factors are correct.	Correct.	All parameters and factors have been revised properly and checked one by one.

	factors are used.	Check that temporal and spatial adjustment factors are used correctly.		
	Examine the integrity of the database files.	Confirm that the appropriate stages of data processing are correctly represented in the database. Confirm that data relationships are correctly represented in the database. Ensure that data fields are properly labeled and have the correct layout specifications. Ensure that sufficient documentation of the database and the structure and operation of the model has been archived.	Correct	All the database files have been checked and examined.
	Examine data consistency across source categories.	Identify parameters (e.g., activity data, constants) that are common to multiple source categories and confirm that there is consistency in the values used for those parameters in emissions calculations.	Correct.	The parameters have been checked investigating its origin and updating the data according to official sources.

	Examine that the inventory data movement between process stages is correct.	Examine that emissions data are correctly aggregated from lower reporting levels to higher reporting levels when preparing summaries. Check that emissions data are correctly transcribed between different intermediate products.	Correct.	Data traceability has been verified.
	Check that uncertainties in emissions reductions are correctly estimated or calculated.	Examine the appropriateness of the qualifications of persons providing expert judgment on uncertaintly estimates. Check that qualifications, assumptions and expert opinions are recorded. Check that calculated uncertainties are complete and have been calculated correctly. If necessary, repeat the error calculations or a reduced sample of the probability distributions used by the Monte Carlo analyses.	Correct.	The uncertainty have been checked and it's not necessary to repeat the calculations.
	Proceed with a review of internal	Examine that detailed internal documentation exists to support the estimates and allow for repeatability of the	Correct	All the documentation and the inventory have been checked

	documentation.	issuance and uncertainty estimates. Review that inventory data, supporting data, and inventory records are on file and stored to facilitate detailed review. Examine the integrity of all arrangements for archiving data from outside organizations involved in preparing the inventory.		by the personal of Hisoil.
	Examine methodological and data changes that dictate recalculations.	Examine temporal consistency in the time series input data for the project. Examine the consistency of the algorithm/method used for calculations across the time series.	Correct.	The parameters have been reviewed taking into account the temporal coherence of the project.
	Conduct comprehensiveness reviews.	Confirm that estimates are presented for all source categories and for all years beginning with the base year appropriate for the current inventory period. Review that known data gaps resulting in incomplete emissions estimates for certain source categories are documented.	Correct.	Data has been checked and all sources have been reviewed for each year.

	Compare estimates with previous estimates.	For the Project, current inventory estimates should be compared with previous estimates. If there are significant changes or deviations from expected trends, re-examine the estimates and explain any differences.	Correct	Since it's the first accreditation period, there is no previous estimations.

16 Quantification of GHG emission reduction / removals

16.1 Baseline emissions

As established by the applied methodology AMS-III.F, the baseline emissions are the amount of methane emitted from the decay of the degradable organic carbon in the biomass solid waste. Hence, the equation used to calculate baseline emission is equation 1:

$$BE_y = BE_{CH4,\ SWDS,y} + BE_{ww,y} + BE_{CH4,\ manure,\ y} - MD_{y,reg} * GWP_{CH4}$$

Where:

BE_y = Baseline emissions in the year y (tCO2e).

$BE_{CH4,\ swds}$ = Yearly methane generation potential of the solid waste composted by the project activity during the years x from the beginning of the project activity (x=1) up to the year y (tCO2e).

$BE_{ww,y}$ = Baseline emissions from the wastewater co-composted, calculated as per the procedures in AMS-III.H (tCO2e).

$BE_{CH4,manure}$ = Baseline emissions from manure composted by the project activities, as per the procedures in AMS-III.D (tCO2e).

$MD_{y,reg}$ = Amount of methane that would have to be captured and combusted in the year y to comply with the prevailing regulations (tone).

GWP_{CH4} = Global Warming Potential for CH4 (t CO2e/t CH4).

Baseline emissions exclude emissions of methane that would have to be captured, fuelled or flared to comply with national or local safety requirement or legal regulations. Since the Government of Argentina has no specific legal regulations about the captured and combusted methane, MDy,reg = 0. Also, the project does not involve manure, co-composting or waste water. So, final equation applied is:

$$BE_y = BE_{CH4,\ SWDS,y}$$

The yearly methane generation potential for the solid waste (BECH4,SWDS) is calculated using, as established by the applied methodology AMS-III.F, the first order decay model as described in the latest version of the methodological tool 04 “Emissions from solid waste disposal sites”. Version 08.1.

Since the methane generation from municipal solid waste is treated with composting technology, the tool is applicable for the project under “Applicability B” of the project activity. As per para 17, the baseline methane emission from solid waste disposal site will be calculated as below:

$$BE_{CH4,SWDS,y} = \varphi_y * (1 - f_y) * GWP_{CH4} * (1 - OX) * \frac{16}{12} * F * DOC_{f,y} * MCF_y * \sum_{x=1}^{y} \sum_y (W_{j,x} * DOC_j * e^{-kj*(y-x)} * (1 - e^{-kj})$$

Where:

$BE_{CH4,\ SWDS,y}$	=	Baseline methane emissions occurring in year y generated from waste disposal at a SWDS during a time period ending in year y (t CO2e/yr).
x	=	Years in the time period in which waste is disposed at the SWDS, extending from the first year in the time period (x = 1) to year y (x = y).
y	=	Year of the crediting period for which methane emissions are calculated (y is a consecutive period of 12 months).
$DOC_{f,y}$	=	Fraction of degradable organic carbon (DOC) that decomposes under the specific conditions occurring in the SWDS for year y.
w_j	=	Amount of solid waste type j disposed or prevented from disposal in the SWDS in the year x (t).
ϕ_y	=	Model correction factor to account for model uncertainties for year y.
f_y	=	Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emissions of methane to the atmosphere in year y.
GWP_{CH4}	=	Global Warming Potential of methane.
OX	=	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste).

F = Fraction of methane in the SWDS gas (volume fraction).

MCF_y = Methane correction factor for year y.

DOC_j = Fraction of degradable organic carbon in the waste type j. (weight fraction)

k = Decay rate for the waste type j (1 / yr)

j = Type of residual waste or types of waste in the MSW

As explained in section 3.1.1 “Applicability conditions of the methodology”, since the project avoids the disposal of waste at a SWDS, the application is B. Hence, the values applied for default and common parameters are:

- Model correction factor to account for model uncertainties for year y(ϕ_y).

As per table 2 (page 7), para 19 (page 8) and Data /Parameter table 1 (page 13) of tool 4, for baseline emissions, values for model correction factor depends on the application of the tool (A or B) and the climate where the SWDS is located. As per para 19 of tool 4, the chosen option to calculate the model correction factor is option 1 (default value) because climatic conditions are available and provided from an official source as Government of Buenos Aires.

Hence, considering:

The application for this project is Application B, as justified in section 3.1.1. about applicability conditions of tool 4.

The National Weather Service of Argentina (Servicio Meteorológico Nacional de Argentina in Spanish)has a weather station at a short distance of 7.34 km, but it doesn’t have data. Hence, the weather stations ”San Miguel” and “San Fernando”, located at 10.24 and 9,50 km respectively from Buenos Aires Norte III as seen in the image below, are taken as a reference to obtain climate data in Buenos Aires Norte III.

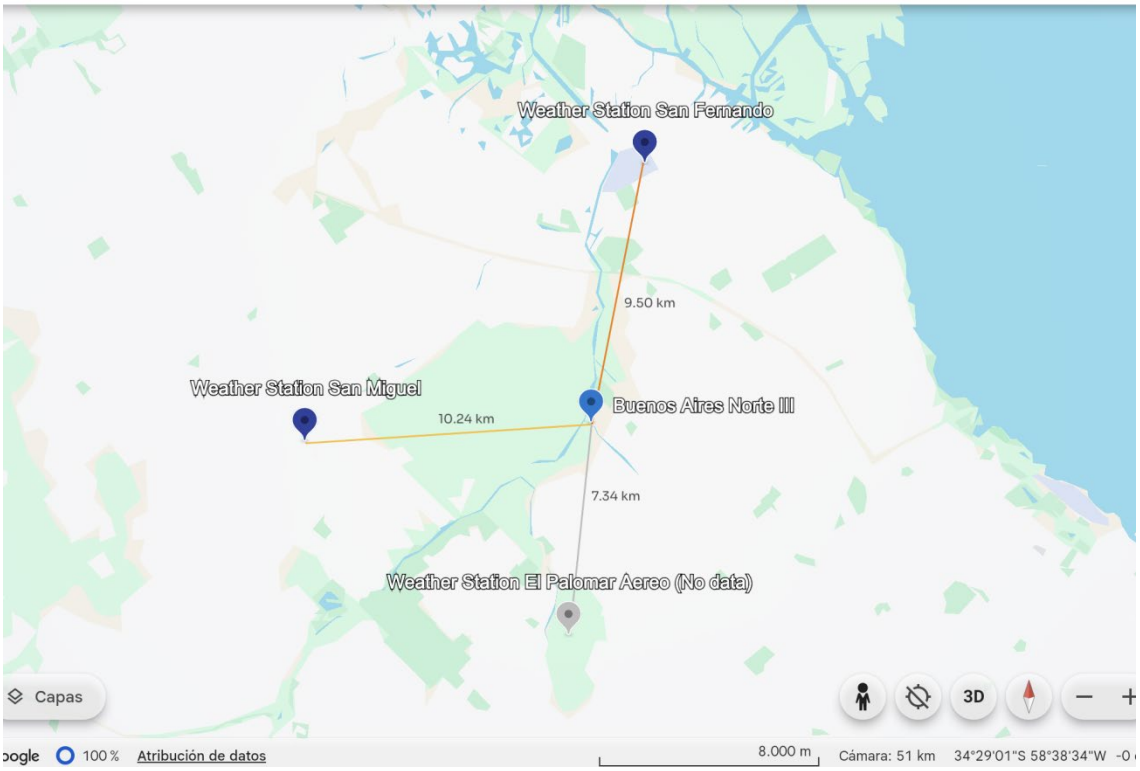

Figure 6. Distance between Weather Stations San Miguel, El Palomar Aereo and San Fernando and Buenos Aires Norte III. Source: Google Earth.

In addition, the Government of Buenos Aires explain the climate conditions of the city and classifies it as "humid".
Therefore, considering the climate and the application B, the value applied for ϕ_y as per Data/Parameter table 1 from the tool 4 is 0,85.

- Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emissions of methane to the atmosphere in year y (fy)

As per table 2, page 8 and Data / Parameter table 10 of tool 4, for application B, this parameter have to be monitored annually. Specifically, to determinate fy, we have to select the maximum value from the following: (a) contract or regulation requirements specifying the amount of methane that must be destroyed/used (if available) and (b) historic data on the amount captured.
As there's no regulation requirements, the value for fy must be the historic data on the amount captured in the SWDS Buenos Aires Norte III for each year. Nevertheless, there are no public data about the fraction of methane captured at this SWDS. There are CDM projects registered by Buenos Aires Norte III (0260, 2785, 0928 and 5861) from 2006 to 2022, but there are no monitoring reports since 2012. In these projects, the project holder ensures an efficiency of the methane recovery of a 60%, but the results of 2012

monitoring report showed that they are the methane recovery is less and the emissions are bigger than they expected. Nowadays, there is no evidence to demonstrate the efficiency of the methane capture system or to provide data on the amount of methane captured and flared or combusted.
In fact, there are evidences that Buenos Aires Norte III is a very inefficient landfill since 2019, as can be seen in this The Guardian's article based on Kayrros methane study and based on this article in the journal Science (Joannes D. Maasakkers et al.,Using satellites to uncover large methane emissions from landfills. Sci. Adv.8,eabn9683(2022). DOI:10.1126/sciadv.abn9683) "The Norte III landfill makes up about half of Argentina's solid waste emissions (49 t hour−1, with 26 t hour−1 coming from managed landfills) reported to the UNFCCC for 2016".
Despite the fact that they have a recovery and combustion system, the landfill is saturated with waste and most of it ends up in an open-air space. When the waste is controlled and ends up in a covered space, the methane capture and burning process works efficiently. However, as the studies mentioned above show, most of the waste is not managed and remains in the open air.
According to data published on CEAMSE website, Norte III treats 436.325 tons of waste per month, although it is known that these are low figures. This means that Hisoil's waste are less than 0,3% of the waste in Norte III. Nothing can guarantee that these wastes will be treated appropriately in a controlled methane recovery area.
Therefore, for all the above mentioned the project holder has decided to give fy a value of 0%.

- Global Warming Potential of methane (GWP_{CH4})
Following the fifth assessment report from IPCC Green House Gas Protocol, the value for GWP_{CH4} is 28 t CO_2e/t_{CH4}.

- Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste) (OX)
As per table 2 (page 7) and Data / Parameter table 2 (page 14) of tool 4, for applications A and B, the default value of OX is 0.1.

- Fraction of methane in the SWDS gas (volume fraction) (F)
As per table 2 (page 7) and Data /Parameter table 3 (page 14) of the tool, for applications A and B, the default value of F is 0.5.

- Fraction of degradable organic carbon (DOC) that decomposes under the specific conditions occurring in the SWDS for month m (weight fraction) ($DOC_{f,y)}$
As per para 18, table 2 of tool 4, for application B and in the case of MSW, $DOC_{f,y}$ has a default value or estimated once. As per para 30 of the same tool, project participants may choose to either apply a default value or to determinate $DOC_{f,y}$ based on

measurements of the BPMMSW. Since there've been no measurements of the biochemical methane potential, the project holder decided to apply a default value ($DOC_{f,default}$). Following Data / Parameter table 4 (page 14 and 15 of tool 4), the value for $DOC_{f,default}$= $DOC_{f,y}$ = 0.5 based on IPCC 2006 Guidelines for National Greenhouse Gas Inventories.

- Methane correction factor for year y (MCF_y)

As per para 18, table 2 of tool 4, for application B,the value applied for MCF_y depends on if SWDS has or not a water table above the bottom of the SWDS. In the baseline scenario there are no water table above the bottom of the SWDS, so the value applied is a default value based on SWDS type. As Data / Parameter table 5, an anaerobic managed solid waste disposal site, as Buenos Aires Norte III must have controlled placement of waste and includes cover material; mechanical compacting and levelling of the waste; as can be seen on their website or in the projects presented to the CDM. Hence, the value for MCF_y is 1.

- Year of the crediting period for which methane emissions are calculated (y is a consecutive period of 12 months) (y)

As explained in section 3.2.3. of this document, the project has a duration of 10 years, so y = 10.

- Values applied to amount of solid waste type j disposed or prevented from disposal in the SWDS in the year x (tonnes) (W_j) are following.

Waste (W_j) (ton)	Garden, yard and park	Food, food waste, beverages and tobacco (other than sludge)	Food waste/Sewage sludge	Other organic putrescible (non food)	Pulp, paper, cardboard...	Wood, wood product	Total (ton)
01/08/19-31/07/20	1,093.30	1,925.15	13,073.49	1,551.01	36.73	0.00	17,679.67
01/08/20-31/07/21	2,254.74	6,318.63	19,278.18	777.93	176.83	11.86	28,818.17
01/08/21-31/07/22	2,036.20	5,368.92	20,975.43	663.68	243.22	72.30	29,359.75
01/08/22-31/07/23	2,288.21	6,813.85	27,735.95	232.51	400.19	0.00	37,470.71

Total	7,672.44	20,426.55	81,063.05	3,225.13	856.97	84.16	113,328.30

Waste quantity has been determined by the delivery notes, cargo manifest and documents of entry of the trucks into Hisoil's facilities. All these documents have been collected and each waste income has been cataloged in the different waste type category (following IPCC 2006 Guidelines for National Greenhouse Gas Inventories). The determination of the waste type is based on the official LER code (Lista Europea de Residuos, in spanish; "European Waste List") and the specifications of the waste provider, which are verified by the project holder while performing the cargo control.

Decay rate for the waste type j (1/yr) (k_j) and Fraction of degradable organic carbon in the waste type j (weight fraction) (DOC_j): as the value depends on the waste type (j), the applied values are following:

Waste type	k_j	DOC_j	Justification
Wood and wood products	0.03	43%	For application B, and data/parameter tables 6 and 7, Tool 004 "Emissions from solid waste disposal sites".
Pulp, paper and cardboard (other than sludge)	0.06	40%	For application B, and data / parameter tables 6 and 7, Tool 004 "Emissions from solid waste disposal sites".
Food, food waste, beverages and tobacco (other than sludge)	0.185	15%	For application B, and data / parameter tables 6 and 7, Tool 004 "Emissions from solid waste disposal sites".
Garden, yard and park waste	0.10	20%	For application B, and data / parameter tables 7, Tool 004 "Emissions from solid waste disposal sites".
Sewage sludge	0.185	5%	According to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, industrial wastewater may be treated on site or released into domestic sewer systems. As specified in in Chapter 6, in the section 2.3, when the residue is released into the domestic sewer system, the emissions are to be included with the domestic wastewater emissions. Sludge from domestic and industrial wastewater treatment plants is addressed in Chapter 2 in the section 2.2, where it is established that default values for degradable organic carbon

			content in sludge are given in Section 2.3 Waste Composition, in the same chapter that determines that for domestic sludge, the default DOC value (as percentage of wet waste assuming a default dry matter content of 10 percent) is 5 percent (range 4-5 percent, which means that the DOC content would be 40-50 percent of dry matter). These criteria are the same indicated in the Data/Parameter tables 6 and 7 of the Tool 04 "Emissions from solid waste disposal sites".
Other putrescible	0.10	20%	According to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 5, Chapter 3, this value depends on the type of waste and its grade of degradation. These criteria are the same as in Data / Parameter tables 6 and 7 of the tool 004 "Emissions from solid waste disposal sites". So, the of for other (non-food) organic putrescible garden and park waste is the same as the value for garden and park waste because of their grade of degradation.

So, the results of the baseline for each year are:

Year	**Baseline (BE)** (tCO_2e)
1 / 1 august 2019-31 July 2020	8,103
2 / 1 august 2020-31 July 2021	14,476
3 / 1 august 2021-31 July 2022	13,962
4 / 1 august 2022-31 July 2023	17,283
TOTAL (ton CO_2e)	53,824

16.2 Project emissions/removals

Project emissions from composting process (PE_y) have been determined as per methodological tool 13 "Project and leakage emissions from composting", version 2. As per the tool, the project emission from composting is calculated as below:

$$PE_y = PE_{COMP,Y} = PE_{EC,Y} + PE_{FC,Y} + PE_{CH4,Y} + PE_{N2O,Y} + PE_{RO,Y}$$

Where:

$PE_{COMP,Y}$ = Project emissions associated with composting in year y (t CO_2e/yr).

$PE_{EC,Y}$ = Project emissions from electricity consumption associated with composting in year y (t CO_2e/yr).

$PE_{FC,Y}$ = Project emissions from fossil fuel consumption associated with composting in year y (t CO_2e/yr).

$PE_{CH4,Y}$ = Project emissions of methane from the composting process in year y (t CO_2e/yr).

$PE_{N2O,Y}$ = Project emissions of nitrous oxide from the composting process in year y (t CO_2e/yr).

$PE_{RO,Y}$ = Project emissions of methane from run-off wastewater associated with co-composting in year y (t CO_2e/yr).

Since the project does not involve co-composting ($PE_{RO,y} = 0$), project emission equation is reduced as $PE_y = PE_{EC,Y} + PE_{FC,Y} + PE_{CH4,Y} + PE_{N2O,Y}$

Determination of project emissions from electricity consumption ($PE_{EC,y}$)

As per tool 13, the determination of project emissions from electricity consumption from the grid shall be calculated using tool 5 "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation", version 03.0. In the generic approach, project emissions are calculated as equation 1, where the project emission source j referred to in the tool is composting.

$$PE_{EC,y} = \sum_j EC_{PJ,j,y} * EF_{EF,j,y} * (1 + TDL_{j,y})$$

Where:

$PE_{EC,y}$ = Project emissions from electricity consumption in year y (t CO_2e/yr).

$EC_{PJ,j,y}$ or $EC_{PJ,comp,y}$ = Quantity of electricity consumed by the project electricity consumption source j in year y (MWh/yr).

$EF_{EF,j,y}$ = Emission factor for electricity generation for source j in year y (t CO_2e/MWh).

$TDL_{j,y}$ = Average technical transmission and distribution losses for providing electricity to source j in year y.

- **Quantity of electricity consumed by the project electricity consumption source j in year y (MWh/yr)** ($EC_{PJ,j,y}$). As established by tool 13, since the electricity consumed provides from the grid but its monitored data is not available, the electricity consumption from composting ($EC_{PJ,comp,y}$) is determined based on a default value for the specific quantity of electricity consumed per tonne of waste composted ($SEC_{comp,default}$), according to equation 3:

$$EC_{PJ,comp,y} = Q_y * SEC_{comp,default}$$

Where:

$EC_{PJ,comp,y}$ = Quantity of electricity consumed for composting in year y (MWh/yr).

Q_y = Quantity of waste composted in year y (t/yr).

$SEC_{comp,default}$ = Default value for the specific quantity of electricity consumed per tonne of waste composted (MWh/t).

- As established by Tool 13, "the **quantity of waste** composted is a parameter required in the determination of emissions associated with each source of project emissions. There are two options to determine the quantity of waste composted in year y. Since option 1 is "Procedure using a weighing device: monitor the weight of waste delivered to the composting installation using an on-site weighbridge or any other applicable and calibrated weighing device", this's the chosen option for the determination of the quantity of waste composted (Q_y). Hence, $Q_y = W_j$.

- As estabilised by data/parameter table 4 of tool 13, **$SEC_{comp,default}$** = 0.01 MWh/t.

So, **quantity of electricity consumed** $EC_{PJ,j,y}$ **are:**

Year	01/08/19-31/07/20	01/08/20-31/07/21	01/08/21-31/07/22	01/08/22-31/07/23
$EC_{PJ,j,y}$ (MWh/year)	176.80	288.18	293.60	374.71

- **Emission factor for electricity generation for source j in year y ($EF_{EF,j,y}$)** (t CO_2/MWh). Based on the information from the Argentine Government: https://www.argentina.gob.ar/economia/energia/energia-electrica/estadisticas ;https://cammesaweb.cammesa.com/download/factor-de-emision/, this emission factor is an average of each year for the period:

Year	2019	2020	2021	2022	2023
$EF_{EF,j,y}$ (t CO_2e/MWh)	0.267	0.2775	0.292	0.2717	0.231

So, values applied $EF_{EF,j,y}$ are an average of each years:

Year	01/08/19-31/07/20	01/08/20-31/07/21	01/08/21-31/07/22	01/08/22-31/07/23
$EF_{EF,j,y}$ (t CO_2e/MWh)	0.271	0.2835	0.28185	0.25135

- **Average technical transmission and distribution losses for providing electricity to source j in year y ($TDL_{j,y}$).** Based on The Wolrd Bank estadistics (IEA), the electric power transmission and distribution losses (% of outputs) in Argentina is 15%. https://data.worldbank.org/indicator/EG.ELC.LOSS.ZS

So, the results of the project emission from electricity consumption are:

YEAR	01/08/19-31/07/20	01/08/20-31/07/21	01/08/21-31/07/22	01/08/22-31/07/23
$PE_{EC,y}$ (t CO_2e)	55	93	95	108

Determination of project emissions from fossil fuel consumption ($PE_{FC,y}$)

According to paragraph 21 of the methodological tool number 13, Project emissions from fossil fuel consumption ($PE_{FC,y}$) can be calculated using a default value as Equation 4:

$$PE_{FC,y} = Q_y * EF_{FC,default}$$

Where:

$PE_{FC,y}$ = Project emissions from fossil fuel consumption associated with composting in year y (tCO_2e/yr).

Q_y = Quantity of waste composted in year y (t/yr).

$EF_{FC,default}$ = Default emission factor for fossil fuels consumed by the composting activity per tonne of waste (tCO_2e/t).

- The **quantity of waste** composted in year y (Q_y) is the same as "Amount of solid waste type j disposed or prevented from disposal in the SWDS in the year x (t)" (W_j) applied in the baseline calculation. Hence, $Q_y = W_j$.

- As per Data /Parameter table 5 of the methodological tool number 13, the value applied for **$EF_{FC,default}$** is 0.0207 t CO_2/ t.

So, the results of the project emission from fossil fuel consumption are:

YEAR	01/08/19-31/07/20	01/08/20-31/07/21	01/08/21-31/07/22	01/08/22-31/07/23
$PE_{FC,y}$ (t CO_2e)	365	596	607	775

Determination of project emissions of methane ($PE_{CH4,y}$)

As per para 22 of the tool 13, project emissions of methane from composting are determined as equation 5: $PE_{CH4,y} = Q_y * EF_{CH4,y} * GWP_{CH4}$

Where:

$PE_{CH4,y}$ = Project emissions of methane from the composting process in year y (t CO_2e / yr).

Q_y = Quantity of waste composted in year y (t / yr).

$EF_{CH4,y}$ = Emission factor of methane per tonne of waste composted valid for year y (t CH_4 / t).

GWP_{CH4} = Global Warming Potential of CH_4 (t CO_2e / t CH_4).

- The **quantity of waste** composted in year y (Q_y) is the same as "Amount of solid waste type j disposed or prevented from disposal in the SWDS in the year x" (tonnes) (W_j) applied in the baseline calculation. So, $Q_y = W_j$

- As per option 2, the default value is used for **emission factor of methane** per tonne of waste; $EF_{CH4,y} = EF_{CH4,default}$. So, according to data/parameter 2: $EF_{CH4,default}$ = 0.002 t CH_4 / t.

Hence, the **emissions of methane** are as following:

YEAR	01/08/19-31/07/20	01/08/20-31/07/21	01/08/21-31/07/22	01/08/22-31/07/23
$PE_{CH4,y}$ (t CO_2e / yr)	990	1,613	1,644	2,098

Determination of project emissions of nitrous oxide ($PE_{N2O,y}$)

As per para 26 of tool 13, project emissions of methane from composting are determined as equation 7:

$$PE_{N2O,y} = Q_y * EF_{N2O,y} * GWP_{N2O}$$

Where:

$PE_{N2O,y}$ = Project emissions of nitrous oxide from the composting process in year y (t CO_2e / yr).

Q_y = Quantity of waste composted in year y (t / yr).

$EF_{N2O,y}$ = Emission factor of nitrous oxide per tonne of waste composted valid for year y (t N_2O / t).

GWP_{N2O} = Global Warming Potential of N_2O(t CO_2e / t N_2O).

- The **quantity of waste** composted in year y (Q_y) is the same as Amount of solid waste type j disposed or prevented from disposal in the SWDS in the year x (t) (W_j) applied in the baseline calculation. $Q_y = W_j$

- As per option 2, default value is used for **emission factor of nitrous oxide** per tonne of waste; $EF_{N2O,y} = EF_{N2O,default}$. So, according to data / parameter table 3 of the methodological tool number 13 $EF_{N2O,default}$ = 0.0002 t N_2O / t.

Hence, the **emissions of nitrous oxide** are as following:

YEAR	01/08/19-31/07/20	01/08/20-31/07/21	01/08/21-31/07/22	01/08/22-31/07/23
$PE_{N2O,y}$ (t CO_2e / yr)	937	1,527	1,556	1,985

In conclusion, **the results of the project emissions** (PE_y) are as following:

YEAR	01/08/19-31/07/20	01/08/20-31/07/21	01/08/21-31/07/22	01/08/22-31/07/23
$PE_{EC,y}$	55	93	95	108
$PE_{FC,y}$	365	596	607	775
$PE_{CH4,y}$	990	1,613	1,644	2,098
$PE_{N2O,y}$	937	1,527	1,556	1,985
TOTAL: PE_y (t CO_2e/yr)	2,347	3,829	3,902	4,966

16.3 Leakages

Based on methodology AMS-III.F, the BCR Standard and the BCR tool “Permanence and Risk Management”, there is no leakage emission from this project activity because:

- The project technology is not the equipment transferred from another activity.
- The existing equipment is not transferred to another activity.
- The compost is not stored in anaerobic condition and not disposed of in a SWDS.

The permanence of the project is ensured because this project is retroactive and the emission reduction is calculated after its commissioning.

So, LEy = 0.

16.4 Net GHG Emission Reductions / Removals

The project is retroactive in the first four years, so the emission reduction of the first period is calculated after the commissioning of the project. The results shown in this document are the consequence of the application of the methodology AMS-III.F for composting non-hazardous solid waste.

All the activities described are the result of the construction of new composting facilities within the period contemplated. Therefore, the equation used as indicated in the methodology AMS-III.F “Avoidance of methane emissions through composting” Version 12.0, is the Equation 2:

ERy= BEy + (PEy - LEy)

Where:

ERy = Emission reduction in the year y (tCO2e)

BEy = Baseline emissions in year y (tCO2e)

PEy = Project emissions in the year y (tCO2e)

LEy = Leakage emissions in year y (tCO2e)

The results and data used for this equation are following.

The total estimated emission reduction during this quantification period are presented in the table bellow.

Year	GHG emission reductions/removals in the baseline scenario (tCO_2e)	GHG emission reductions/removals in the project scenario (tCO_2e)	GHG emissions attributable to leakages (tCO_2e)	Estimated Net GHG Reduction/Removals (tCO_2e)
01/08/19-31/07/20	8,103	2,347	0	5,756
01/08/20-31/07/21	14,476	3,829	0	10,647
01/08/21-31/07/22	13,962	3,902	0	10,060
01/08/22-31/07/23	17,283	4,966	0	12,317
TOTAL (t CO_2e)	53,824	15,044	0	38,780

16.5 Comparison of actual emission reductions with estimates in the project document

Not applicable because is the first period.

16.6 Remarks on difference from estimated value in the registered project document

Not applicable because is the first period.

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