

TREATMENT OF NON-HAZARDOUS ORGANIC WASTE TO OBTAIN COMPOST

Document prepared by Hisoil SRL

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| Name of the project | <i>Treatment of non-hazardous organic waste to obtain compost.</i> |
| Project holder | <i>Hisoil SRL</i> |
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| Other project participants | <i>There are no other project participants</i> |
| Version | <i>1</i> |
| Date | <i>29/10/2024</i> |
| Project type | <i>Composting: waste handling and disposal project.</i> |

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| Grouped project | <i>Not a grouped project</i> |
| Applied Methodology (ies) | <i>AMS.III-F. Avoidance of methane emissions through composting. Version 12.</i> |
| Project location (City, Region, Country) | <i>20 de junio s/n, La Rinconada, Cardales, Exaltación de la Cruz. Argentina.</i> |
| Starting date | <i>01/08/2019</i> |
| Quantification period of GHG emissions reduction | <i>01/08/2019 to 31/07/2029</i> |
| Estimated total and average annual GHG emission reduction/removals amount | <i>The total GHG emission reduction is 112,682 ton CO₂e (average annual 11,268 ton CO₂e).</i> |
| Sustainable Development Goals | <ul style="list-style-type: none"> – <i>SDG 8. Decent work and economic growth.</i> – <i>SDG 9. Industry, Innovation and Infrastructure.</i> – <i>SDG 11. Sustainable Cities and Communities.</i> – <i>SDG 12. Responsible consumption and production.</i> – <i>SDG 13. Climate action.</i> |
| Special category, related to co-benefits | <i>No special category</i> |

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1 Project type and eligibility

1.1 Scope in the BCR Standard

The project is eligible under the scope of the BCR Standard (section 6) by meeting one or more of the following condition:

| The scope of the BCR Standard is limited to: | |
|---|---|
| The following greenhouse gases, included in the Kyoto Protocol: Carbon Dioxide (CO ₂), Methane (CH ₄) and Nitrous Oxide (N ₂ O). | X |
| GHG projects using a methodology developed or approved by BioCarbon, applicable to GHG removal activities and REDD+ activities (AFOLU Sector). | |
| Quantifiable GHG emission reductions and/or removals generated through implementation of GHG removal activities and/or REDD+ activities (AFOLU Sector). | |
| GHG projects using a methodology developed or approved by BioCarbon, applicable to activities in the energy, transportation and waste sectors. | |
| Quantifiable GHG emission reductions generated through implementation of activities in the energy, transportation and waste sectors. | X |

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 mentioned in BCR Standard version 3.4, the project is eligible because it's GHG emission reduction focused on the use of waste and the reduction of GHG emissions that would be generated during the treatment and final disposal of waste. The project includes recovery and recycling of materials coming from waste.

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. This methodology is applicable to the

composting of the organic fraction of municipal solids and biomass residues from of agricultural or agro-industrial activities. This methodology includes the construction of treatment facilities.

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.

1.2 Project type

| | |
|---|---|
| Activities in the AFOLU sector, other than REDD+ | |
| REDD+ Activities | |
| Activities in the energy sector | |
| Activities in the transportation sector | |
| Activities related to Handling and disposing of waste | X |

1.3 Project scale

The BCR Standard section 11.3 establishes that projects in sectors other than AFOLU are subdivided into large-scale and small-scale, following the definitions of the CDM. The Clean Development Mechanism Booklet establishes that methodology AMS-III.F is a small-scale project. The same document establishes that small-scale methodologies are grouped into three different types. As the project activities has less than 60 kt CO₂ equivalent per year in emission reductions, the project is small-scale type III.

Hence, the project is small-scale.

2 General description of the project

- (a) *The existing scenario prior to the implementation of the project activities is a clear demonstration of the importance of the existence of Hisoil: the large amount of non-*

hazardous, dangerous and pathogenic organic waste in Argentina is estimated at 11,000,000 tons, only 10% is adequately treated. Thanks to Hisoil, much more of that non-hazardous organic from different origins including urban solid organic waste can be transform into organic compost.

- (b) This project will reduce the emissions generated from methane emissions originated in the degradation of non-treated organic wastes in landfills or waste disposal areas where they will rotten and decompose.*
- (c) The project doesn't apply to any special categories.*
- (d) This project is aligned with five SDGs:*
 - SDG 8 "Decent work and economic growth": 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 9 "Industry, innovation and infrastructure": 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 11 "Sustainable cities and communities": 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 12 "Responsible consumption and production": the project involves the Recycling and reusing organic non-hazardous waste to transform it into compost increasing the national recycling rate.*
 - SDG 13 "Climate action": by composting non-hazardous organic waste, the project reduces the generation of greenhouse gas emissions.*
- (e) The total emission reductions attributable to the project activities are bellow:*

| YEAR | TOTAL EMISSIONS SAVINGS (ton CO ₂ e) |
|--------------------------------|--|
| 1 / 1 august 2019-31 July 2020 | 5,756 |
| 2 / 1 august 2020-31 July 2021 | 10,647 |

| | |
|---------------------------------|---------|
| 3 / 1 august 2021-31 July 2022 | 10,060 |
| 4 / 1 august 2022-31 July 2023 | 12,317 |
| 5 / 1 august 2023-31 July 2024 | 12,317 |
| 6 / 1 august 2024-31 July 2025 | 12,317 |
| 7 / 1 august 2025-31 July 2026 | 12,317 |
| 8 / 1 august 2026-31 July 2027 | 12,317 |
| 9 / 1 august 2027-31 July 2028 | 12,317 |
| 10 / 1 august 2028-31 July 2029 | 12,317 |
| TOTAL (ton CO ₂ e) | 112,682 |

2.1 GHG project name

Treatment of non-hazardous organic waste to obtain compost.

2.2 Objectives

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.

Hisoil is also constantly looking to incorporate new technologies and innovation to foster the efficiency in the composting process to ensure a high-quality product while minimizing the energy and fuel consumption required.

By contributing to generate a viable product originated from residues, Hisoil boosts the circular economy principles working with nearby customers and suppliers strengthening waste's valorization and working aligned with sectorial, industrial and environmental regulations, legislations and strategies.

2.3 Project activities

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.

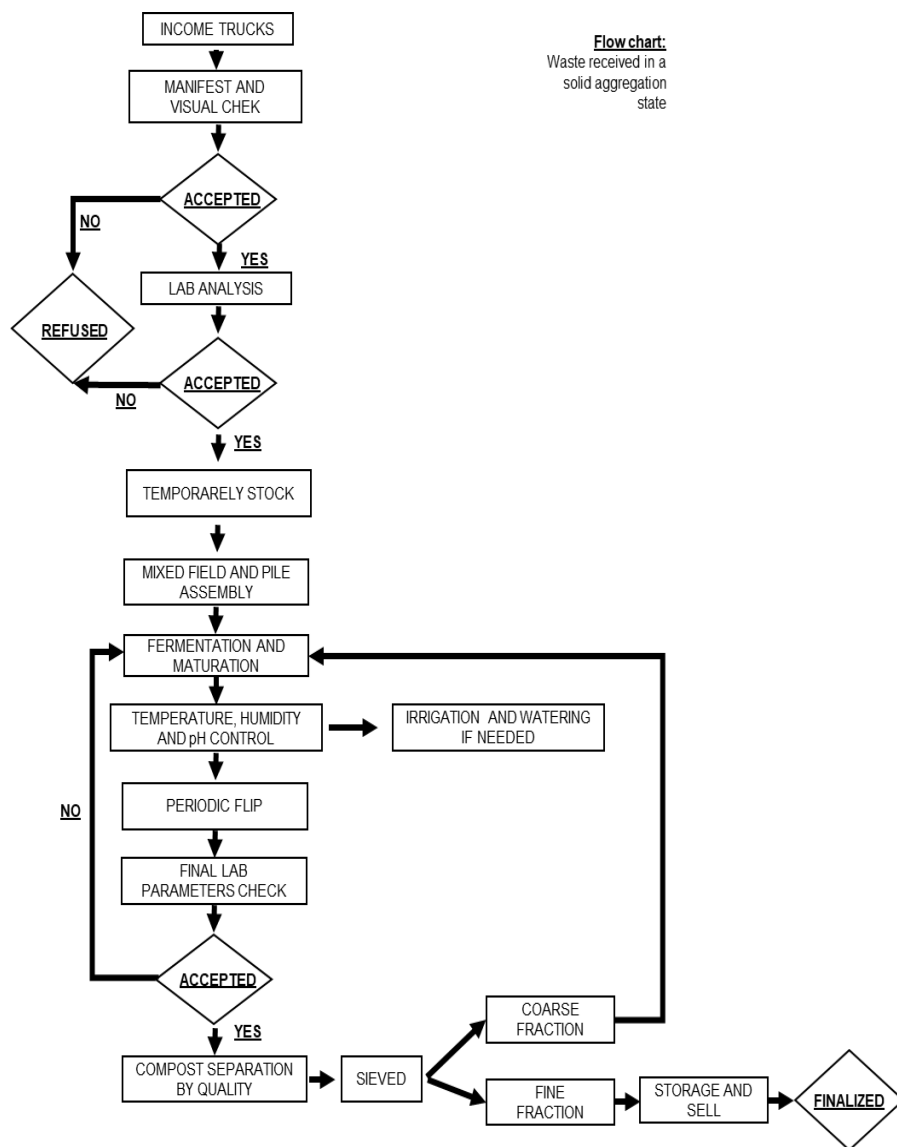


Figure 1. Chart of the process for the reception of waste in Hisoil.

Income control

Even though it can come from different origins, Hisoil only accepts organic non-hazardous wastes, which means that there is a cargo control process to ensure that the residues admitted on the plant are compatible with the project composting activity. All residues must present a validated manifest, which is a document signed by the waste control responsible technician from the company that originate the residue and presented to the transporter annexed to the weight check.

Once the transport reaches Hisoil installations, the manifest is checked and verified and an ocular inspection of the cargo take place to ensure that the type and weight of the residues being transport are aligned with the manifest information.

Once the cargo has been verified (both waste type and weight), is directed to one of the two gathering areas where it ' s disposed (depending on the type of materials), where it will be temporarily stocked until the moment it will be collected and used in the composting process.

Lab analysis

In order to ensure the maximum quality, a laboratory analysis of the accepted waste takes place. If the lab result determines that the material does not have the quality levels and characteristics required to be properly composted it ' s notified to the operators and the material is separated from the rest and rejected.

Mix - Field Assembly

The different materials accepted are combined to obtain an adequate Carbon/Nitrogen balance in the resulting mass, and an optimum fermentation time frame to make the entire process as efficient as possible and a humidity ratio of 45 - 55%.

| DRY BASE | |
|--|----|
| MATERIALS | % |
| Pruning waste chip | 25 |
| Organic waste + Coffee Grounds (if needed) | 25 |
| Sludge from different liquids and ashes | 25 |
| Sludge from different industries + chip + coffee grounds (if needed) | 25 |

Some of the semi-solid, liquids or sludges need a previous treatment in order to obtain the appropriated consistency for its aggregation to the piles. This process consists in the

addition of horse bedding or pruning waste chip in a small pile of 10 m² where the wastes are added and mixed and when the desired consistency is obtained is ready to add to the mix.

Piles assembly

To maximize the efficiency of the composting process the residues are mixed and place in piles in the four areas established to that end (A, B, C and D). Every pile has an approximated volume of 440 m³ (length 80 m, with 4,9 m at the base and 1,2 m at the top and height 1,7 m). Every area is properly identified and monitored.

Maturation and pile flip

For a correct maturation of the organic material and the generation of compost, the ventilation process is key. To achieve that, the piles are periodically flipped to mix all the materials, homogenizing the composition, temperature and humidity. The temperature of the pile descent 5 to 10 °C after every flipped. If the maturing process is still taking place, the temperature will rise again.

The compost is flipped every three days up to a total amount of 20 flips in 60 days and water should be added in every flip if necessary. To address this, both temperature and humidity are controlled and monitored. The watering criteria are the following:

Piles could be watered up to 30 days, past that time it should be verified with the lab results to control the microorganism ' s activity levels.

Plies required a minimum amount of 10-12 watering cycles to maintain microorganism ' s activity levels.

After 40 - 45 days is especially important to use only water and not other effluents or liquids that could reactivate the decomposition process of the microorganisms.

To flip the piles a compost turner it's used and the particular model in operation in Hisoil has also the capability of threshing and reducing particle sizes, making unnecessary a previous grinding of some of the wastes used.

During the maturation period lab analysis is conducted to verify the conditions and quality control measures. There are three main analyses conducted:

- *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.*
- *Odor test: once a week an odor test is conducted and if the result is positive, the pile will be flipped to ensure a correct oxygenation of the compost.*
- *Final lab parameters: to be considered ready the compost needs to meet the following criteria:*
 - o *pH between 5.5 - 7.5.*
 - o *Conductivity minor o equal to 2.5.*
 - o *Germination: after seven days a germination level of stem and root between 3 - 5.*
 - o *Temperature between 25 - 30 °C.*

Compost compilation

Once the final lab parameters are obtained, the compost is ready to be gathered to process and sale. The piles are disassembled and sieved. Depending of the quality obtainable is separated and classified and stored in geometrical piles (cubical) to control the total volume of final product and stock management. The coarse fraction resulting after the sieving is reused in other compost piles.

If after a four to six month period, the pile still hasn't met the final lab parameters, it will be disassembled and transported to a maturation area where it will be monitored until it reaches the quality levels established to be considered as commercially valuable.

Pools control:

To obtain the water used for watering the compost pile when needed, there are three pools which accumulate the lixiviation water from rains in the area. To ensure their optimal condition they are periodically verified to control that there are no signs of contamination or waste spilling like solid waste found on the surface. If a cleaning process is necessary, the operator will notify the plant chief and the waste will be retired and transported to the disposal areas.

Equipment and installations

- Special residues deposit.
- Reception and storage area.
- Final product deposit separated by quality.
- Office.
- Auxiliary shelter of maintenance.
- Front shovel SEM943.
- Laboratory equipped with thermometers, heater, high temperature oven, spectrophotometer, calibrated weight scales, pH-meter, conductometer, chemical products and general equipment to conduct tests (glass Erlenmeyer, beakers, etc.).
- Rotary sieve.
- Water pump.
- Compost Turner TAGRAM model FD500
- Crusher mill.
- Centrifugal pumps.

2.4 Project location

| Physical address of Hisoil | Geographic coordinates of the project |
|--|---------------------------------------|
| 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 Earth.

2.5 Additional information about the GHG Project

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3 Quantification of GHG emissions reduction

3.1 Quantification methodology

This project activity applied latest CDM Methodology AMS-III.F: "Avoidance of methane through composting", Version 12.0.

3.1.1 Applicability conditions of the methodology

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 program of activities by a designated operating entity that uses this methodology, the application of sectoral scope 13 is mandatory.

AMS-III.F: "Avoidance of methane through composting", v.12.0.

| Applicability | Justification |
|--|---|
| <i>This methodology comprises measures to avoid the emissions of methane to the atmosphere from biomass or other organic matter that would have otherwise been left to decay anaerobically in a solid waste disposal site (SWDS), or in an animal waste management system (AWMS), or in a wastewater treatment system (WWTS). In the project activity, controlled aerobic treatment by composting of biomass is introduced.</i> | <i>The project involves reducing the emission of methane into the atmosphere from organic matter that otherwise they 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. Therefore, the project meets the applicability conditions.</i> |
| <i>The project activity does not recover or combust landfill gas from the disposal site (unlike AMS-III.G) and does not undertake controlled combustion of the waste that is not treated biologically in a first step (unlike AMS-III.E). Project activities that recover biogas from wastewater treatment shall use the methodology AMS-III.H. Project activities involving co-digestion of organic matters shall apply the methodology AMS-III.AO.</i> | <i>The project fulfils the applicability conditions because does NOT involve:</i> <ul style="list-style-type: none"> <i>- Recover or combust landfill gas from disposal site.</i> <i>- Undertake controlled combustion of the waste that is not treated biologically in a first step.</i> <i>- Recover biogas from wastewater treatment.</i> <i>- Co-digestion of organic matters.</i> <i>- Animal manure treatment.</i> |
| <i>Measures are limited to those that result in emission reductions of less than or equal to 60 kt CO₂ equivalent annually.</i> | <i>The annual average emission reduction is 11,268 ton CO₂e/year on average, which is less than 60 kt CO₂ equivalent annually.</i> <i>Hence, the project fulfils the applicability conditions.</i> |
| <i>This methodology is applicable to the composting of the organic fraction of municipal solid waste and biomass waste from agricultural or agro-industrial activities including manure.</i> | <i>The project activity consists of composting the organic fraction of municipal solid waste into compost. Therefore, the project meets the applicability condition.</i> |
| <i>This methodology includes construction and expansion of treatment facilities as well as activities that increase capacity utilization at an existing facility. For project activities that increase capacity</i> | <i>Not applicable.</i> <i>The condition is not applicable for this project because it doesn't include</i> |

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| utilization at existing facilities, project participant(s) shall demonstrate that special efforts are made to increase the capacity utilization, that the existing facility meets all applicable laws and regulations and that the existing facility is not included in a separate project activity. | construction and expansion of treatment facilities. |
| This methodology is also applicable for co-composting wastewater and solid biomass waste, where wastewater would otherwise have been treated in an anaerobic wastewater treatment system without biogas recovery. The wastewater in the project scenario is used as a source of moisture and/or nutrients to the biological treatment process e.g. composting of empty fruit bunches (EFB), a residue from palm oil production, with the addition of palm oil mill effluent (POME) which is the wastewater co-produced from palm oil production. | Not applicable. The condition is not applicable for this project as the project does not involve co-composting. |
| In case of co-composting, if it cannot be demonstrated that the organic matter would otherwise been left to decay anaerobically, baseline emissions related to such organic matter shall be accounted for as zero, whereas project emissions shall be calculated according to the procedures presented in this methodology for all co-composted substrates. | Not applicable. The condition is not applicable for this project as the project does not involve co-composting. |
| The location and characteristics of the disposal site of the biomass, animal manure and co-composting wastewater in the baseline condition shall be known, in such a way as to allow the estimation of its methane emissions, using the provisions of AMS-III.G, AMS III.E (concerning stockpile), AMS-III.D or AMS-III.H respectively. | In absence of the project and according to argentine's regulation, waste would be left to decay in the nearest landfill: Buenos Aires Norte III, which receives approximately 85% of the total waste in the project area (Buenos Aires Metropolitan Area, AMBA), according to official information from CEAMSE . As the project is retroactive, the baseline calculations aren't based on estimations, and the location and characteristics of the disposal site are known. The project involves the |

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| | <p>composting of the organic fraction of solid waste and doesn't involve co-composting wastewater, recovering methane or animal manure treatment. Therefore, methodologies AMS AMS-III.G, AMS III.E (concerning stockpile), AMS-III.D and AMS-III.H are not applicable and the project meets the applicability conditions.</p> |
| <p>Blending materials may be added in the project scenario to increase the efficiency of the composting process (e.g. to achieve a desirable C/N ratio or free air space value), however, only monitored quantity of solid waste or manure or wastewater diverted from the baseline treatment system is used for emission reduction calculation. Project activities for composting of animal manure shall also meet the requirements under paragraphs 3 and 4(c) of the latest version of AMS-III.D.</p> | <p>For the calculation of the reduction of emissions, only the amount of solid waste that diverted from the reference disposal site, the landfill, is considered. No emission reductions will be claimed for the mixing materials. The project does not involve animal manure treatment. Therefore, the project meets the applicability condition.</p> |
| <p>For solid wastes diverted from a solid waste disposal site, the following requirement shall be checked ex ante at the beginning of each crediting period:</p> <p>(a) Establish that identified landfill(s)/stockpile(s) can be expected to accommodate the waste to be used for the project activity for the duration of the crediting period; or</p> <p>(b) Establish that it is common practice in the region to dispose of the waste in solid waste disposal site (landfill)/stockpile(s).</p> | <p>In absence of the project, the waste used in the project activity during the crediting period would be the landfill Buenos Aires Norte III managed by the public company CEAMSE. This landfill receives approximately 85% of the total waste in the project area (Buenos Aires Metropolitan Area, AMBA), according to official information from CEAMSE. Hence, the project identified Buenos Aires Norte III as the landfill can be expected to accommodate the waste to be used for the project activity for the duration of the crediting period.</p> |

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| <p><i>The project participants shall clearly define the geographical boundary of the region referred in paragraph 11(b) and document it in the PDD. In defining the geographical boundary of the region, project participants should consider the source of the waste i.e. if waste is transported up to 50 km, the region may cover a radius of 50 km around the project activity. In addition, it should also consider the distance to which the final product after composting will be transported. In either case, the region should cover a reasonable radius around the project activity that can be justified with reference to the project circumstances but in no case it shall be more than 200 km. Once defined, the region should not be changed during the crediting period(s).</i></p> | <p><i>The applicable geographical area considered for this project is the Metropolitan Area of Buenos Aires (AMBA) region determined by the capital Buenos Aires and 40 municipalities of Buenos Aires Province. The main reason for this selection is the origin of the residues treated belonging to this area and the distribution of the population. More than the 83% of the population of the entire province is located in this area and within the AMBA more than 77% are located in the capital Buenos Aires. This area is less than 200 km. Also, the landfill Buenos Aires Norte III is 35 km away from Hisoil's facilities. Therefore, the project meets the applicability condition.</i></p> |
| <p><i>In case produced compost is handled aerobically and submitted to soil application, the proper conditions and procedures (not resulting in methane emissions) must be ensured.</i></p> | <p><i>Conditions and procedures are set for the compost handling to ensure no methane is emitted during the handling. Hence, the project fulfils the applicability condition.</i></p> |
| <p><i>In case produced compost is treated thermally/mechanically, the provisions in AMS-III.E related to thermal/mechanical treatment shall be applied.</i></p> | <p><i>Not applicable. No thermal or mechanical treatment is involved in the post production process.</i></p> |
| <p><i>In case produced compost is stored under anaerobic conditions and/or delivered to a landfill, emissions from the residual organic content shall to be taken into account and calculated as per the latest version of the methodological tool "Emissions from solid waste disposal sites" .</i></p> | <p><i>Not applicable. The produced compost is sold to customers as and when it is produced. The compost is not stored under anaerobic condition or delivered to the landfill.</i></p> |

Also, the tools applied were:

| Tool 4. Emissions from solid waste disposal sites. Version 08.1. | |
|--|---|
| Applicability | Justification |
| <p>The tool can be used to determine emissions for the following types of applications: (a) Application A: The CDM project activity mitigates methane emissions from a specific existing SWDS. Methane emissions are mitigated by capturing and flaring or combusting the methane (e.g. “ACM0001: Flaring or use of landfill gas”). The methane is generated from waste disposed in the past, including prior to the start of the CDM project activity. In these cases, the tool is only applied for an ex ante estimation of emissions in the project design document (CDM-PDD). The emissions will then be monitored during the crediting period using the applicable approaches in the relevant methodologies (e.g. measuring the amount of methane captured from the SWDS); (b) Application B: The CDM project activity avoids or involves the disposal of waste at a SWDS. An example of this application of the tool is ACM0022, in which municipal solid waste (MSW) is treated with an alternative option, such as composting or anaerobic digestion, and is then prevented from being disposed of in a SWDS. The methane is generated from waste disposed or avoided from disposal during the crediting period. In these cases, the tool can be applied for both ex ante and ex post estimation of emissions. These project activities may apply the simplified approach detailed in 0 when calculating baseline emissions.</p> | <p>This project used application B) because the project activity avoids the disposal of waste in a specific SWDS (Buenos Aires Norte III). Municipal solid waste (MSW) is treated with an alternative option (composting) and is then prevented from being disposed of in a SWDS.</p> |

| Tool 5. “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” Version 03.0. | |
|--|---------------|
| Applicability | Justification |

| | |
|--|--|
| <p><i>If emissions are calculated for electricity consumption, the tool is only applicable if one out of the following three scenarios applies to the sources of electricity consumption:</i></p> <p><i>(a) Scenario A: Electricity consumption from the grid. The electricity is purchased from the grid only, and either no captive power plant(s) is/are installed at the site of electricity consumption or, if any captive power plant exists on site, it is either not operating or it is not physically able to provide electricity to the electricity consumer; (b) Scenario B: Electricity consumption from (an) off-grid fossil fuel fired captive power plant(s). One or more fossil fuel fired captive power plants are installed at the site of the electricity consumer and supply the consumer with electricity. The captive power plant(s) is/are not connected to the electricity grid; or (c) Scenario C: Electricity consumption from the grid and (a) fossil fuel fired captive power plant(s). One or more fossil fuel fired captive power plants operate at the site of the electricity consumer. The captive power plant(s) can provide electricity to the electricity consumer. The captive power plant(s) is/are also connected to the electricity grid. Hence, the electricity consumer can be provided with electricity from the captive power plant(s) and the grid.</i></p> | <p><i>Since the electricity will be consumed only from grid, the project emission from electricity consumption is estimated as Scenario A.</i></p> |
| <p><i>This tool can be referred to in methodologies to provide procedures to monitor amount of electricity generated in the project scenario, only if one out of the following three project scenarios applies to the recipient of the electricity generated: (a) Scenario I: Electricity is supplied to the grid; (b) Scenario II: Electricity is supplied to consumers/electricity consuming facilities; or (c) Scenario III: Electricity is supplied to the grid and consumers/electricity consuming facilities.</i></p> | <p><i>Not applicable.</i></p> <p><i>The project does not involve electricity production.</i></p> |

Tool 13. "Project and leakage emissions from composting". Version 02.0.

| <i>The following sources of project emissions are accounted for in this tool:</i> | |
|--|---|
| <i>Applicability</i> | <i>Justification</i> |
| <i>CH₄ and N₂O emission from composting.</i> | <i>Applicable because of the project involves composting.</i> |
| <i>CO₂ emissions from consumption of fossil fuels and electricity associated with composting.</i> | <i>Applicable because this tool is applied for the project emissions that involves consumption of fossil fuels and electricity.</i> |
| <i>CH₄ emissions from run-off wastewater associated with co-composting.</i> | <i>Not applicable because there is not co-composting in this project.</i> |
| <i>The following sources of leakage emissions are accounted for in this tool:</i> | |
| <i>Applicability</i> | <i>Justification</i> |
| <i>CH₄ emissions from the anaerobic decay of the residual organic content of compost disposed of in a landfill or subjected to anaerobic storage.</i> | <i>Applicable because of the project involves composting.</i> |

3.1.2 Methodology deviations (if applicable)

Not applicable because there is no methodology derivations.

3.2 Project boundaries, sources and GHGs

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 stored 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.*

| | | |
|---------------|-------------------|-------------------|
| <i>INCOME</i> | <i>PRODUCTION</i> | <i>DEPARTURES</i> |
|---------------|-------------------|-------------------|

| | | |
|--|--|---|
| <ul style="list-style-type: none"> - Organic non-hazardous residues from different origins. - Fuel consumption until reaching the plant (doesn't correspond to Hisoil). - Packing material. | <ul style="list-style-type: none"> - Composting and packaging. - Power consumption. - Fuel consumption. | <ul style="list-style-type: none"> - Distribution. -Electricity consumption (included in production). |
|--|--|---|

3.2.1 Spatial limits of the project

The following chart resumes the different stages of the process included in the project summarizing the installations and equipment required as well as the incomes and GHG generated in every step within the project boundaries. This information could be completed by also checking the flowchart and project activity description in section 2.3 of this same document.

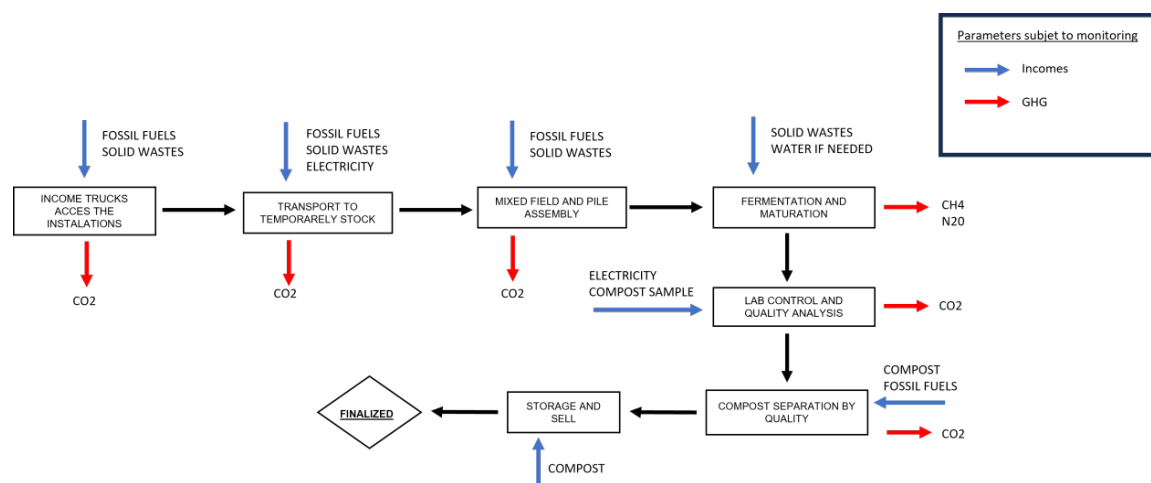


Figure 3. Chart of the stages of the process included in the project: all facilities, systems equipment, mass and energy flows, emission sources, GHGs and the parameter monitored (incomes).

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

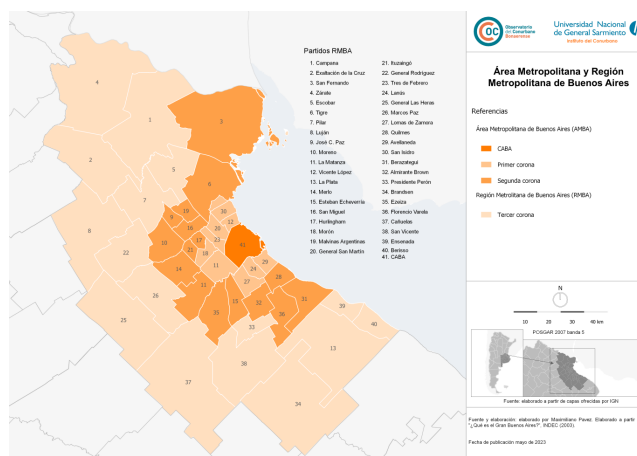


Figure 4. Metropolitan and Regional Area of Buenos Aires. Source: [Observatorio del Conurbano Bonaerense, Universidad Nacional del General Sarmiento, 2023.](#)

As per para 21 a), the physical, geographical site where the solid waste would have been disposed and the methane emission occurs in absence of the proposed project activity is Buenos Aires Norte III landfill, which is located 35 km away from Hisoil's installations and collect the 85% of the waste in the Metropolitan and Regional Area of Buenos Aires.

As per para 21 c), d) and e) establishes, the sites where the treatment of biomass through composting takes place, where the products from composting (compost) is handled, disposed, submitted to soil application, or treated thermally/mechanically and the itineraries between all these process where the transportation of waste, wastewater, where applicable manure, product of treatment (compost) occurs, are all the Hisoil's facilities.

3.2.2 Carbon reservoirs and GHG sources

| Source or reservoir | GHG | Included (Yes/No/Optional) | Justification |
|-----------------------------------|------------------|----------------------------|--------------------------|
| Baseline scenario - landfill site | CO ₂ | No | Not significant. |
| | CH ₄ | Yes | Main source of emission. |
| | N ₂ O | No | Not significant. |

| | | | |
|------------------------------------|------------------|-----|---|
| Project scenario - composting site | CO ₂ | Yes | Emission from fossil fuel consumption and electricity associated with composting. |
| | CH ₄ | Yes | Significant emission from composting. |
| | N ₂ O | Yes | Significant emission from composting. |

3.2.3 Time limits and analysis periods

The project has a duration of 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.

3.2.3.1 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.

3.2.3.2 Quantification period of GHG emission reductions/removals

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.

3.2.3.3 Monitoring periods

The project is carried out annually for 10 years, since 01/08/2019 to 31/07/2029. The validation and verification will be done, following the BCR Standard and the BCR Validation and Verification Manual, every three years. As the project is a retroactive project, the first period’s been already validated and verified. So, the next periods of validation and verification are since 01/08/2023 to 31/07/2026 and since 01/08/2026 to 31/07/2029.

3.3 Identification and description of the baseline or reference scenario

Following BCR Standard, BCR Guidelines “Baseline and Additionality” and methodology AMS-III.F [“Avoidance of methane through composting”](#), the reference or baseline scenario is the situation representing the GHG emissions that would occur in the absence of a GHG project.

In the absence of the project activity, organic matter in the municipal solid waste will be dumped and left to decay at the landfill site located within the project boundary; and, in consequence, methane is emitted to the atmosphere. Hence, the baseline scenario is the continued dumping of the waste on the existing landfill site in the absence of the project activity. This landfill is Buenos Aires Norte III, managed by the public company CEAMSE. This landfill receives approximately 85% of the total waste in the project area (Buenos Aires Metropolitan Area, AMBA), according to official information from [CEAMSE](#).

Buenos Aires Norte III is a landfill [located](#) near the northern suburbs of Buenos Aires. According to data published on [CEAMSE website](#), Norte III treats 436.325 tons of waste per month, which represents 85% of the total waste in the system. In this landfill there are a Mechanical Biological Treatment plant, Leachate Liquid Treatment Plants, Gas Treatment Plants and Electric Power Generation, Composting plant, manufacturing of ecobricks and two social spaces. There are four 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 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. Maasackers 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.

The baseline emissions are the amount of methane emitted from the decay of the degradable organic carbon in the biomass solid waste, not wastewater or manure. As the project begins less than five years before the start of validation, the baseline in first four years (since 01/08/2019 to 31/07/2023) has been calculated and verified because of the validation of amount of waste disposed and used by the project holder.

3.4 Additionality

Non-hazardous residues as the ones used in the valorization process of Hi-Soil are regulated by the Law of Integral Management of Household Wastes N° 25.916. This regulation established 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 Hi-Soil 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 N° 25.916.

As mentioned in BCR Standard and in BCR's "Baseline and Additionality Guidance", in waste sector the additionality determination of the project activity follows the methodological tool "[Tool for the demonstration and assessment of additionality, version 07.0.0](#)" provided by CDM. The basic structure of the process is detailed according to the sequence specified by the methodology:

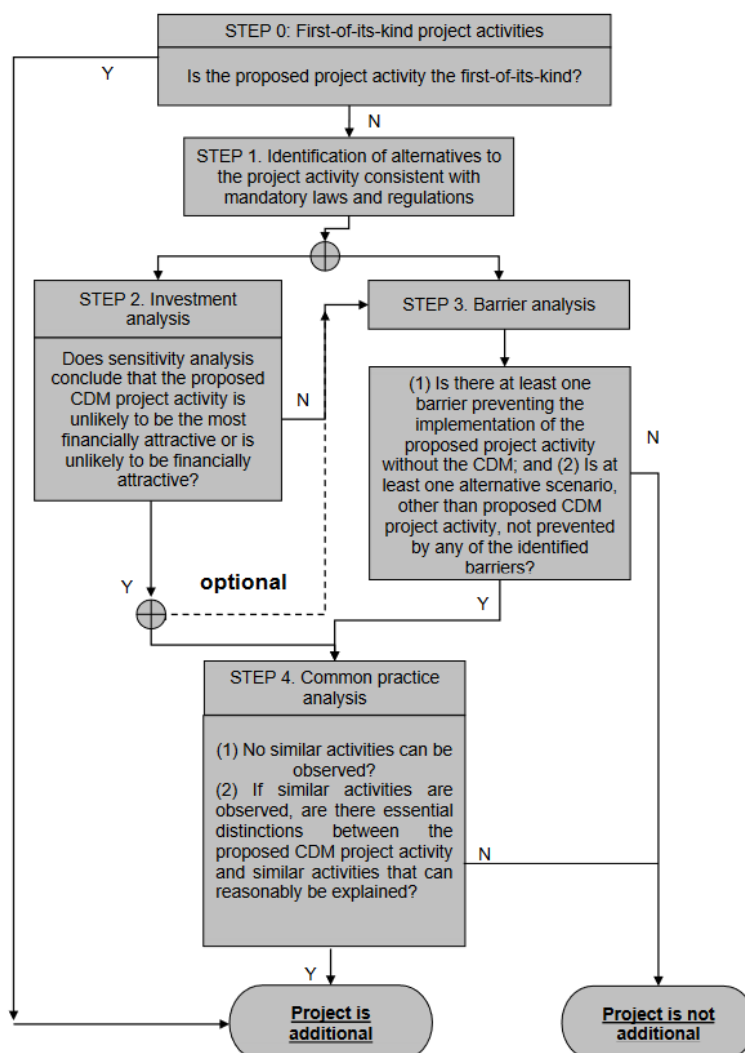


Figure 4. Basic structure of additionality process. Source: [Tool for the demonstration and assessment of additionality, version 07.0.0.](#)

Step 0:

The project it ' s not the first of its kind.

Step 1:

For the correct identification of alternatives to the project activity consistent with mandatory laws and regulations the guidelines established in Sub-step 1a: Define

alternatives to the project activity of the Tool for the demonstration and assessment of additionality, version 07.0.0 have been implemented.

- **Alternative 1.** The proposed project activity undertaken without being registered as a CDM project activity: this alternative is compelling with the current legislation as the valorization process of HiSoil are regulated by the 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.

- **Alternative 2.** Transport of residues to waste treatment plants like Buenos Aires Norte III managed by CEAMSE: The complex Buenos Aires Norte III is the closest to HiSoil suppliers and is the most reasonable assumption although any other of the CEAMSE installations will also be compelling with the current regulations as the law of Integral Management of Household Wastes N° 25.916. establishes 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 and in any case the valorization is a recommendation and not mandatory.

- **Alternative 3.** Different composting systems or technologies such as vermiculture: The implementation of the production of vermicompost is also aligned with the resolution 1/2019 or RESFC-2019-1-APN-SECCYMA#SGP as it focuses on the final characteristics of the product to be commercialize and it could be achieved with different methods while providing a similar product.

Step 3:

The project faces Investment barriers, other than the economic/financial barriers in Step 2: there is one significant barrier when comparing the project with other organizations, which is that similar activities with comparable volume of production have only been implemented with grants or other non-commercial finance terms. Specifically, being public companies or installations managed by public administrations at local or regional level.

There are two main factors to consider regarding the non-commercial financial terms. Firstly, during the period 2019- 2022 according to the National Plan of Public Investment (PNIP in Spanish), public investment in Argentina regarding waste management installations has been limited to four projects all of them located in different provinces than the one where the project activity takes place and all of them aim to create and develop projects similar to the ones operated by CEAMSE (public companies). Those five projects are the ones listed with the following Project of Public Investment Bank (BAPIN in Spanish) code:

- BAPIN n ° 42338: Construction of a waste treatment and valorization plant in Jujuy Province.

- BAPIN n ° 64347: Construction of a waste treatment and valorization plant in Catamarca Province.
- BAPIN n ° 64352: Construction of a waste treatment and valorization plant in Río Negro Province.
- BAPIN n ° 101972: Construction of the environmental center “El Borbollón ” in the metropolitan area of Mendoza in Mendoza Province.
- BAPIN n ° 111891: Construction of a waste treatment and valorization plant for the city of Corrientes in Corrientes Province.

Secondly, the biggest investment effort regarding Municipal Solid Waste (MSW) solid treatment in Argentina has come as result of a collaboration between the Argentinian Government and the Interamerican Development Bank (BID in Spanish).

This collaboration has been conducted through two BID Loans, BID N ° 3249/OC-AR and BID N ° 5567/OC-AR. Both programs have the same focus a Program for Municipal Solid Waste Treatment, being the second one a continuation of the first one. These loans are executed through Operative Programs that established the terms and conditions to access the funds and clarifies that the beneficiaries (entities susceptible of accessing the funds) as municipalities, development commissions, association of various municipalities and/or development commissions and/or Provinces which they belong.

All things considered Similar activities have only been implemented with grants or other non-commercial finance terms, and therefore, there is Investment barriers, other than the economic/financial barriers in Step 2 as the Tool for the demonstration and assessment of additionality, version 07.0.0 defines it in paragraph 51 in Sub-step 3a: Identify barriers that would prevent the implementation of the proposed CDM project activity.

Sub-step 3b requires to show that the identified barriers would not prevent the implementation of at least one of the alternatives, therefore a comparison of the alternatives determined where confronting them with the barrier found has been done:

- **Alternative 1. The proposed project activity undertaken without being registered as a CDM project activity:** faces the barriers identified as a private company.
- **Alternative 2. Transport of residues to waste treatment plants like Buenos Aires Norte III managed by CEAMSE:** The company CEAMSE which develops a similar activity with in the same area is a public company, controlled by both the government of the province of Buenos Aires and the autonomous city of Buenos Aires. It will be susceptible of receiving funds both from the PNIP and BID Loans, which means that it won't be affected by the barrier identified.
- **Alternative 3. Different composting systems or technologies such as vermiculture:** If this company is privately operated faces the same barriers as Alternative 1 and it's affected by the barrier established.

A barrier has been found and this barrier does not prevent the implementation of unless one of the alternatives, satisfying the requirements of Step 3.

Step 4:

To determine if the project activity is a common practice the methodological tool in use is [Tool 24 Common practice”, version 03.1.](#)

The applicable geographical area considered for this project is the Metropolitan Area of Buenos Aires (AMBA) region determined by the capital Buenos Aires and 40 municipalities of Buenos Aires Province. The main reason for this selection is the origin of the residues treated belonging to this area and the distribution of the population. More than the 83% of the population of the entire province is located in this area and within the AMBA more than 77% is located in the capital Buenos Aires.

The highly concentrated population and industries makes the demand and potential suppliers to concentrate in this area making very difficult to operate outside while remaining an economically feasible project.

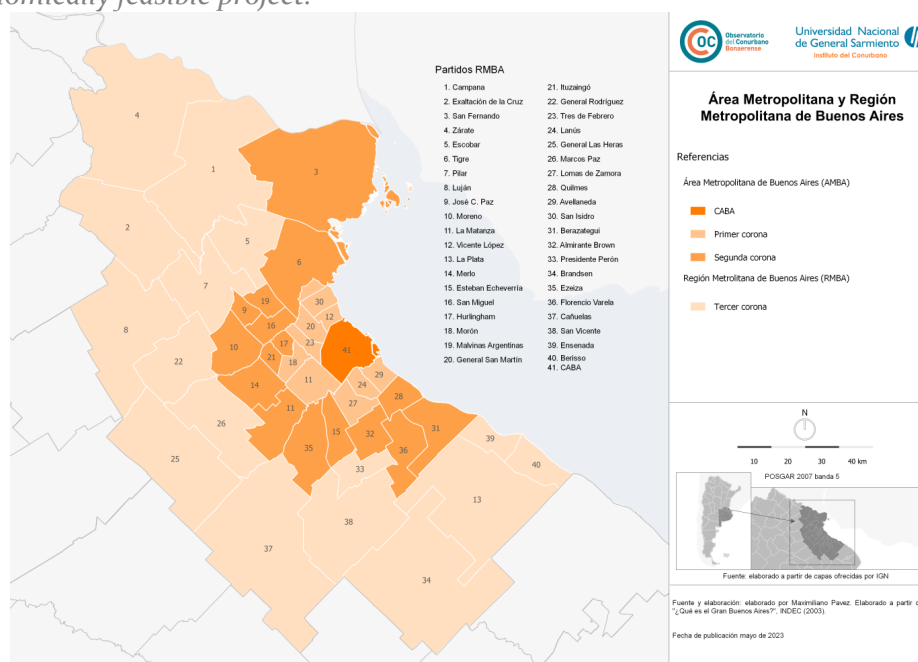


Figure 5. Metropolitan and Regional Area of Buenos Aires. Source: [Observatorio del Conurbano Bonaerense, Universidad Nacional del General Sarmiento, 2023.](#)

1. There are two installations with output range as +/-50% of the total design capacity or output of the proposed project activity.

One of them are managed by CEAMSE: Environmental complex Buenos Aires Norte III.

The second one is the net of public composting centers of the city. Separately they would not have a size to be included, but considering that they are managed as a net they have been included as a unit, this net includes the composting centers of Palermo, Chacarita and Villa Soldati.

2. The two of them fulfill the conditions established in Step 2 of the methodological tool:
 - a) Same geographical area.
 - b) Similar activity and measure.
 - c) They use similar feedstock although not identical but similar in a significant percentage.
 - d) They produce compost with similar potential commercial applications.
 - e) They are within an output range of +/-50% of the total design capacity or output of HiSoil.
 - f) They started to operate before the project design document PDD elaboration.
3. None of them are registered CDM project activities, project activities submitted for registration, nor project activities undergoing validation. In Buenos Aires Norte III there are CDM projects but they are focused on landfill gas recovery following the methodologies ACM0001, ACM0002 and AM0011 and does not impact the composting activity realized in the complex. This means that $N_{all} = 2$.
4. All the projects identified are publicly operated and managed since they belong to either a public company CEAMSE or they are controlled and managed by the city of Buenos Aires. This means that the composting activity is undertaken under a different technology according to the [Tool 24 Common practice", version 03.1](#), that states in its paragraph 4 that a different technology could be the investment climate on the date of the investment decision, including subsidies or other financial flows. Being all the alternatives identified publicly operated all have been developed under different subsidies and financial flows by being implemented thanks to public investment.

Considering that all the projects use a different technology, $N_{diff} = 2$.

5. $F = 1 - N_{diff} / N_{all} = 0$, and $N_{all} - N_{diff} = 0$.
6. In order to be considered common practice it is required that F is greater than 0.2 and $N_{all} - N_{diff}$ is greater than 3. In this case, $F = 0$ and $N_{all} - N_{diff} = 1$, which means the project is not common practice.

In HiSoil's case:

- The most realistic and feasible alternative to the project according to legislation is the transport of residues to the waste treatment plant of Buenos Aires Norte III managed by CEAMSE.

- *There are investment barriers others than the economic/financial barriers in Step 2 that do not prevent the implementation of at least one of the alternatives.*
- *The project is not considered ad common practice.*

All things considered this project is additional.

3.5 Uncertainty management

In line with the principle of conservative attitude, this project uses conservative assumptions, values and procedures to ensure that it's not an overestimation emission reductions or increases in GHG removals. To manage the uncertainty in the quantification baseline and mitigation results, this project applies different mechanisms for each datum.

When using default values, following the conservative principle, traditional values of the settings and the most recent version of official documents have been used, based on IPCC Guidelines for National Greenhouse Gas Inventories (2006), BCR Standard and their tools and Clean Development Mechanism tools and methodologies, in their latest version. All of those parameters and their sources are indicated at section 16 "Monitoring plan". The uncertainty of the estimates of project reductions is related to the activity data and emission factors:

- *Emission factors: official and specific sources for each category, based on 2006 IPCC Guidelines for National GHG Inventories and official data from Argentine Government: fossil fuel emission factor and electricity generation emission factor.*
- *General factors: unofficial and verified sources by the project holder or other external 's analysis. Waste quantity is directly measured by income control trucks and weighted and volume check of accepted cargos and measure and checked data referring waste volume based on bills information from suppliers and clients.*

3.6 Leakage and non-permanence

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, $LE_y = 0$.

3.7 Mitigation results

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:

$$ER_y = BE_y + (PE_y - LE_y)$$

Where:

ER_y = Emission reduction in the year y (tCO_2e)

BE_y = Baseline emissions in year y (tCO_2e)

PE_y = Project emissions in the year y (tCO_2e)

LE_y = Leakage emissions in year y (tCO_2e)

The results and data used for this equation are following.

| PERIOD | BASELINE EMISSIONS (tCO_2e) | PROJECT EMISSIONS (tCO_2e) | LEAKAGE EMISSIONS (tCO_2e) | EMISSION REDUCTION (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 |
| 01/08/23-31/07/24 | 17,283 | 4,966 | 0 | 12,317 |

| | | | | |
|----------------------------|---------|--------|---|---------|
| 01/08/24-31/07/25 | 17,283 | 4,966 | 0 | 12,317 |
| 01/08/25-31/07/26 | 17,283 | 4,966 | 0 | 12,317 |
| 01/08/26-31/07/27 | 17,283 | 4,966 | 0 | 12,317 |
| 01/08/27-31/07/28 | 17,283 | 4,966 | 0 | 12,317 |
| 01/08/28-31/07/29 | 17,283 | 4,966 | 0 | 12,317 |
| TOTAL (tCO ₂ e) | 157,522 | 44,840 | 0 | 112,682 |

3.7.1 Eligible areas within GHG project boundaries (AFOLU sector projects)

Not applicable because it's not an AFOLU project.

3.7.2 Stratification (Projects in the AFOLU sector)

Not applicable because it's not an AFOLU project.

3.7.3 GHG 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:

$$BE_y = BE_{CH_4, SWDS, y} + BE_{ww, y} + BE_{CH_4, manure, y} - MD_{y, reg} * GWP_{CH_4}$$

Where:

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

$BE_{CH_4, swds}$ = 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).

$BE_{CH_4, manure}$ = 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_{CH_4} = Global Warming Potential for CH_4 ($t\ CO_2e/t\ CH_4$).

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, $MD_{y,reg} = 0$. Also, the project does not involve manure, co-composting or waste water. So, final equation applied is:

$$BE_y = BE_{CH_4, SWDS, y}$$

The yearly methane generation potential for the solid waste ($BE_{CH_4, SWDS}$) 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:

$$BE_{CH_4, SWDS, y} = \varphi_y * (1 - f_y) * GWP_{CH_4} * (1 - OX) * \frac{16}{12} * F * DOC_{f, y} * MCF_y * \sum_{x=1}^y \sum_y (W_{j, x} * DOC_j * e^{-kj * (y-x)} * (1 - e^{-kj}))$$

Where:

$BE_{CH_4, SWDS, y}$ = Baseline methane emissions occurring in year y generated from waste disposal at a SWDS during a time period ending in year y ($t\ CO_2e/yr$).

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_{CH_4} = 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:

1. The application for this project is Application B, as justified in section 3.1.1. about applicability conditions of tool 4.
2. 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.

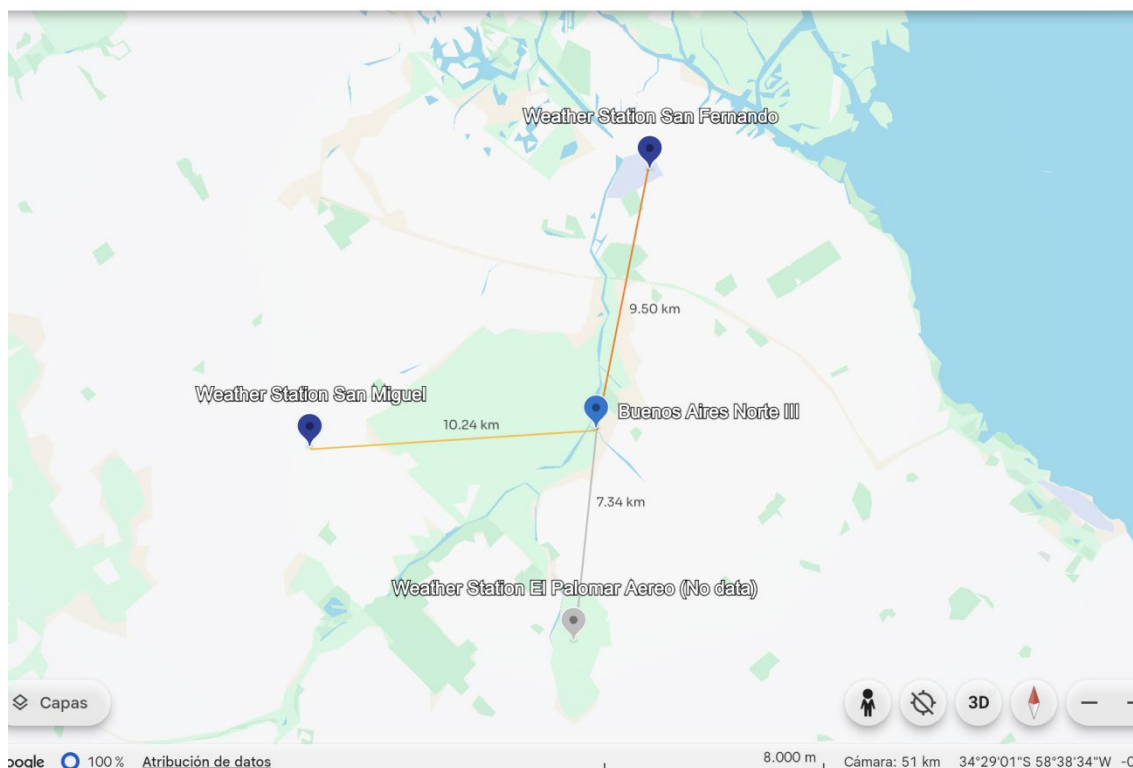


Figure 6. Distance between Weather Stations San Miguel, El Palomar Aereo and San Fernando and Buenos Aires Norte III. Source: Google Earth.

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 (f_y)

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 f_y , 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 f_y 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 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 f_y a value of 0%.

- Global Warming Potential of methane (GWP_{CH_4})

Following the fifth assessment report from [IPCC](#) Green House Gas Protocol, the value for GWP_{CH_4} is 28 t CO₂e/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 BPM_{MSW} . 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/Sewag e sludge | Other organic putrescib le (non food) | Pulp, paper, cardboa rd... | 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 |

As the project is retroactive, the values for next years (since 01/08/2023 to 31/07/2029) are the same as last period quantified (since 01/08/2022 to 31/07/2023) per year.

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". |

| | | | |
|--|--------------|------------|---|
| <i>Pulp, paper and cardboard (other than sludge)</i> | <i>0.06</i> | <i>40%</i> | <i>For application B, and data / parameter tables 6 and 7, Tool 004 “Emissions from solid waste disposal sites” .</i> |
| <i>Food, food waste, beverages and tobacco (other than sludge)</i> | <i>0.185</i> | <i>15%</i> | <i>For application B, and data / parameter tables 6 and 7, Tool 004 “Emissions from solid waste disposal sites” .</i> |
| <i>Garden, yard and park waste</i> | <i>0.10</i> | <i>20%</i> | <i>For application B, and data / parameter tables 7, Tool 004 “Emissions from solid waste disposal sites” .</i> |
| <i>Sewage sludge</i> | <i>0.185</i> | <i>5%</i> | <i>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” .</i> |
| <i>Other putrescible</i> | <i>0.10</i> | <i>20%</i> | <i>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 “</i> |

| | | | |
|--|--|--|--|
| | | | 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 ₂ e) |
|---------------------------------|---------------------------------------|
| 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 |
| 5 / 1 august 2023-31 July 2024 | 17,283 |
| 6 / 1 august 2024-31 July 2025 | 17,283 |
| 7 / 1 august 2025-31 July 2026 | 17,283 |
| 8 / 1 august 2026-31 July 2027 | 17,283 |
| 9 / 1 august 2027-31 July 2028 | 17,283 |
| 10 / 1 august 2028-31 July 2029 | 17,283 |
| TOTAL (ton CO ₂ e) | 157,522 |

3.7.4 GHG project emissions

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:

$$PE_y = PE_{COMP,Y} = PE_{EC,Y} + PE_{FC,Y} + PE_{CH_4,Y} + PE_{N_2O,Y} + PE_{RO,Y}$$

Where:

$PE_{COMP,Y}$ = Project emissions associated with composting in year y (t CO₂e/yr).

$PE_{EC,Y}$ = Project emissions from electricity consumption associated with composting in year y (t CO₂e/yr).

$PE_{FC,Y}$ = Project emissions from fossil fuel consumption associated with composting in year y (t CO₂e/yr).

$PE_{CH_4,Y}$ = Project emissions of methane from the composting process in year y (t CO₂e/yr).

$PE_{N_2O,Y}$ = Project emissions of nitrous oxide from the composting process in year y (t CO₂e/yr).

$PE_{RO,Y}$ = Project emissions of methane from run-off wastewater associated with co-composting in year y (t CO₂e/yr).

Since the project does not involve co-composting ($PE_{RO,y} = 0$), project emission equation is reduced as $PE_y = PE_{EC,Y} + PE_{FC,Y} + PE_{CH_4,Y} + PE_{N_2O,Y}$

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 CO₂e/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 CO₂e/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 established by data/parameter table 4 of tool 13, $SEC_{comp,default} = 0.01 \text{ MWh/t}$.

So, quantity of electricity consumed $EC_{PJ,y}$ 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 |
|---------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| $EC_{PJ,y}$ (MWh/year) | 176.80 | 288.18 | 293.60 | 374.71 |

As the project is retroactive, the values for next years (since 01/08/2023 to 31/07/2029) are the same as last year quantified per year: 374.71 MWh per year.

- **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 | 0.275 | 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 |

For the estimation period since 1/august/2023 to 31/July/2029, the value for $EF_{EF,j,y}$ is the same as for year 4: 0.25135 t CO_2e /MWh per year.

- **Average technical transmission and distribution losses for providing electricity to source j in year y ($TDL_{j,y}$).** 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>

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 ₂ e) | 55 | 93 | 95 | 108 |

For the estimation period since 1/august/2023 to 31/July/2029, the value for $PE_{EC,y}$ is the same as for year 4: 108 t CO₂e per year.

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 (tCO₂e/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 (tCO₂e/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 CO₂/ 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 ₂ e) | 365 | 596 | 607 | 775 |

For the estimation period since 1/august/2023 to 31/July/2029, the value for $PE_{EC,y}$ is the same as for year 4: 775 t CO₂e per year.

Determination of project emissions of methane ($PE_{CH_4,y}$)

As per para 22 of the tool 13, project emissions of methane from composting are determined as equation 5: $PE_{CH_4,y} = Q_y * EF_{CH_4,y} * GWP_{CH_4}$

Where:

$PE_{CH_4,y}$ = Project emissions of methane from the composting process in year y (t CO₂e / yr).

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

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

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

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; $EF_{CH_4,y} = EF_{CH_4,default}$. So, according to data/parameter 2: $EF_{CH_4,default} = 0.002$ t CH₄ / 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 |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| $PE_{CH_4,y}$ (t CO ₂ e / yr) | 990 | 1,613 | 1,644 | 2,098 |

For the estimation period since 1/august/2023 to 31/july/2029, the value for $PE_{CH_4,y}$ is the same as for year 4, 2,098 t CO₂e per year.

Determination of project emissions of nitrous oxide ($PE_{N_2O,y}$)

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

$$PE_{N_2O,y} = Q_y * EF_{N_2O,y} * GWP_{N_2O}$$

Where:

$PE_{N_2O,y}$ = Project emissions of nitrous oxide from the composting process in year y (t CO₂e / yr).

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

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

GWP_{N_2O} = Global Warming Potential of N₂O (t CO₂e / t N₂O).

- 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; $EF_{N_2O,y} = EF_{N_2O,default}$. So, according to data / parameter table 3 of the methodological tool number 13 $EF_{N_2O,default} = 0.0002$ t N₂O / 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 |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| $PE_{N_2O,y}$ (t CO ₂ e / yr) | 937 | 1,527 | 1,556 | 1,985 |

For the estimation period since 1/august/2023 to 31/July/2029, the value for $PE_{N_2O,y}$ is the same as for year 4, 2,195.11 t CO₂e per year.

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 |
| $PE_{CH_4,y}$ | 990 | 1,613 | 1,644 | 2,098 |
| $PE_{N_2O,y}$ | 937 | 1,527 | 1,556 | 1,985 |

| | | | | |
|--|-------|-------|-------|-------|
| TOTAL: PE _y (t CO ₂ e/yr) | 2,347 | 3,829 | 3,902 | 4,966 |
|--|-------|-------|-------|-------|

For the estimation period since 1/august/2023 to 31/July/2029, the value for PE_y is the same as for year 4,966 t CO₂e per year.

3.7.5 GHG 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, LE_y = 0.

The total estimated emission reduction during the project’s quantification period are presented in the table below.

| Year | GHG emission reductions/removals in the baseline scenario (tCO ₂ e) | GHG emission reductions/removals in the project scenario (tCO ₂ e) | GHG emissions attributable to leakages (tCO ₂ e) | Estimated Net GHG Reduction/Removals (tCO ₂ e) |
|-------------------|--|---|---|---|
| 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 |
| 01/08/23-31/07/24 | 17,283 | 4,966 | 0 | 12,317 |

| | | | | |
|--------------------------------|---------|--------|---|---------|
| 01/08/24- 31/07/25 | 17,283 | 4,966 | 0 | 12,317 |
| 01/08/25- 31/07/26 | 17,283 | 4,966 | 0 | 12,317 |
| 01/08/26- 31/07/27 | 17,283 | 4,966 | 0 | 12,317 |
| 01/08/27- 31/07/28 | 17,283 | 4,966 | 0 | 12,317 |
| 01/08/28- 31/07/29 | 17,283 | 4,966 | 0 | 12,317 |
| TOTAL (t CO ₂ e) | 157,522 | 44,840 | 0 | 112,682 |
| Annual average | 15,752 | 4,484 | 0 | 11,268 |

4 Compliance with Laws, Statutes and Other Regulatory Frameworks

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 BIOCOP 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 N° 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 7. Map of territories with current, traditional and public occupation (Law 26,160) of the Indigenous Affairs Institute. Source: INAI "[Instituto Nacional de Asuntos Indígenas](#)"

5 Carbon ownership and rights

5.1 Project holder

| | |
|-----------------------------------|---|
| Individual or organization | <i>Hisoil SRL</i> |
| Contact person | <i>abriel Prieto</i> |
| Job position | <i>Managing partner</i> |
| Address | <i>Street 20 de Junio S/N, municipality of Almirante IRIZAR, Partido de Exaltación de la Cruz, Buenos Aires Province, Argentina</i> |
| Phone number | <i>54-9 11 4986-1488</i> |

| | |
|--------------|-----------------------|
| Email | gprieto@Hisoil.com.ar |
|--------------|-----------------------|

5.2 Other project participants

There are no other project participants.

5.3 Agreements related to carbon 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.

5.4 Land tenure (Projects in the AFOLU sector)

Not applicable because it's not an AFOLU project.

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 Risk management

As BCR Tool “Permanence and risk management, version 1.0 establish, with the aim of coordinating the actions to prevent potential emergencies, Hisoil has implemented a contingency plan that includes different risks and actions. All risks have been identified by using the BRC Tool Permanence and Risk Management Version 1.1. and considered low because each of them represents the risk of impact less than 5% of the carbon benefits accumulated by the project to the verification time.

The tool also specifies that all the risks scored as medium and high should include a mitigation measurement and should be monitored. In this case, no medium or high risks have been identified but since the project is already operating, measures have been planned in case one of the identified risks would increase its impact in upcoming verification periods. However, since it’s not required for low risks, they have been not implemented or monitored yet.

- **Environmental Risk:** identification of the potential natural and anthropogenic risks that GHG mitigation actions may face and determine the measures necessary to mitigate such risks.

| Risk | Score | Measures |
|---|-------|---|
| Natural phenomena - Flood | Low | <ul style="list-style-type: none"> – Lixiviation pools to collect rain water. – Location of the pools according to train levels and runoff lines. |
| Natural phenomena - Wind | Low | <ul style="list-style-type: none"> – Surrounding vegetal barrier conform by trees and bushes that minimize the impact of wind. |
| Air pollution | Low | <ul style="list-style-type: none"> – Watering the roads to minimize the small dust particles in the air. – Installed Volatile Organic Compounds detectors to measure, control and verify air quality. |
| Water pollution | Low | <ul style="list-style-type: none"> – Phreatic wells monitoring and control to grant water quality. |
| Fire - forest, grass, waste piles or organic waste composting process | Low | Emergency Response Plan in place to prevent and avoid damage to combustible materials on storage and natural damage. |

| | | |
|---|------------|--|
| <i>Personal risk or transportation incident</i> | <i>Low</i> | <ul style="list-style-type: none"> – <i>Demarcation, signaling and maintenance of internal streets and accessible.</i> – <i>Accident prevention and first aid courses.</i> |
|---|------------|--|

- **Financial Risk:** identified potential financial risks related to expected costs and investments, as well as project cash flows and defined measures to mitigate financial risks.

| <i>Risk</i> | <i>Score</i> | <i>Measures</i> |
|--------------------------------------|--------------|--|
| <i>Increase in cost and expenses</i> | <i>Low</i> | <ul style="list-style-type: none"> – <i>Diversification of suppliers to minimize costs of obtaining and transportation of non-hazardous organic matter to compost.</i> |
| <i>Low cash flow</i> | <i>Low</i> | <ul style="list-style-type: none"> – <i>Continuation of the expansion plan to increase the number of suppliers and clients, increasing the business volume and cash flow.</i> |

- **Social Risk:** determined medium and short-term risks associated with the participation of local communities and stakeholders in the activities proposed.

| <i>Risk</i> | <i>Score</i> | <i>Measures</i> |
|--|--------------|---|
| <i>Change in governmental priorities</i> | <i>Low</i> | <ul style="list-style-type: none"> – <i>Establish measures to ensure the project's independence from governmental help and self-operating capacity.</i> – <i>Closed work with local governments to collaborate in local policies.</i> |
| <i>Problems in communication with the stakeholders</i> | <i>Low</i> | <ul style="list-style-type: none"> – <i>Implementation of the communication and consultation plan to align the different stakeholders' priorities.</i> |

- **Leakage and non-permanence:** in order to keep possible leakages under control, the following criteria will be maintained as it has been applied to date.

- *Control that every waste treated fulfils the requirements of being organic non-hazardous materials.*

- *Avoiding the transport and deposition of organic non-hazardous wastes (including urban solid waste) on to landfills and its decay generating GHG emissions.*
- *Maintaining a correct register of all waste received and composted within the facilities.*
- *Maintaining the environmental monitored and controlled policies to prevent water and air pollution and any other damage to the environment as well as compiling with the requirements of the periodic environmental audition for the Annual Environmental Authorization (CAA in Spanish) required to manage waste in Argentina according to legislation.*

The data control required to monitor and control the GHG reduction process are the same that are required to verify the correct functioning of the company, therefore, the mechanisms of monitoring and control applied for both criteria.

The information will be collected and controlled for the VCC that will be conducted every three years maximum during the duration of the project.

7.1 Reversal Risk

This is a case of an ex-post project, which means that the current activity has been operating for five years already. All the project participants and stakeholders are already committed and with contracts in place. The possible difficulties could be of a financial and social nature and have already been considered in the risk management plan.

The best proof of the commitment of the stakeholders involved is the trajectory and expansion of the project in the previous years and its expansion and growth since the beginning.

As BCR tool “Risk and permanence” establishes, for projects “other than AFOLU”, the system automatically discounts a reserve of 10% of the total quantified GHG emission reductions for each verified period. This percentage of the VCC generated during the verification process will be placed in the General Reserve Account in the BCR.

7.1.1 Loss Event Report

If an event occurs that means loss or decrease of the VCCs issued and registered in the registry platform, Hisoil will inform and provide a report to BCR within a period of no more than one year after the event occurred.

The lost event report will include a conservative estimate of the loss of previously verified emission reductions/removals due to losses in carbon stocks from the project, based on monitoring report and according with the methodologies and calculations established by the corresponding tools.

During the monitoring and verification period, subsequent to the loss event, the monitoring report will reflect the loss from the loss event and calculate the net GHG benefit for the monitoring period in accordance with the methodology applied.

8 Sustainable development safeguards (SDSs)

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 not 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. |

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| <i>Detrimental excess of nutrients caused by the use of fertilizers and/or pesticides?</i> | No | <i>No pesticides are used in the composting process</i> |
| <i>Inadequate waste management practices, leading to the improper disposal of project- related waste and potential environmental harm?</i> | No | <i>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.</i> |
| <i>Inefficient resource use, including energy, water, and raw materials, leading to increased environmental footprint?</i> | Potentially | <i>The income and cargo controlled with the lab tests are implemented to determine the amount and frequency of certain process like piles flip that required energy and fuel consumption.</i> |
| <i>Losing productive agricultural land to urban expansion, impacting local food production, rural livelihoods, and overall food security?</i> | No | <i>The project activity imposes no risk to food security but instead provide with an organic sustainable source of fertilizers applicable to agricultural activities.</i> |
| <i>Urbanization, leading to the urban heat island effect, impacting local climates and potentially contributing to higher energy consumption for cooling?</i> | No | <i>The project activity does not imply urban growth or the construction of new buildings and facilities that significantly contribute to higher energy consumption.</i> |
| <i>Disrupting natural drainage systems, leading to increased vulnerability to floods, soil erosion, or other hydrological issues?</i> | Potentially | <i>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.</i> |
| <i>Inadequate recycling and reuse of project-related resources, leading to unnecessary waste and environmental impact?</i> | No | <i>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.</i> |
| <i>Deforestation or degradation of forested areas impacting carbon sequestration, biodiversity, and ecosystem services?</i> | No | <i>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.</i> |
| <i>Changes in agricultural practices, such as intensive monoculture, leading to soil degradation, loss of biodiversity, and increased vulnerability to pests?</i> | No | <i>The project does not need or impulse changes in agricultural practices that lead to monoculture, soil or biodiversity damage.</i> |

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| <i>Urbanization or infrastructure development leading to changes in land use patterns and potential habitat fragmentation?</i> | No | <i>The project activity does not require of significant urbanization or infrastructure to be fully functional.</i> |
|--|----|--|

Water

| <i>Could the project/initiative activities potentially entail or result in:</i> | <i>Response</i> | <i>Mitigation or preventive action</i> |
|---|--------------------|---|
| <i>Exacerbating water scarcity or depleting water resources?</i> | <i>Potentially</i> | <i>The lixiviation pools collect rain water to avoid having to use water from reservoirs and aquifers</i> |
| <i>Water pollution, including contamination of rivers, lakes, oceans, or aquifers as a result of project-related activities such as emissions, spills, or waste disposal?</i> | <i>Potentially</i> | <i>There are several phreatic wells within the installations and water quality control analysis are conducted regularly</i> |
| <i>Disrupting aquatic ecosystems, including marine life, river ecosystems, or wetlands, due to changes in water quality, temperature, or flow patterns?</i> | No | <i>The project does not imply any spilling of waste in aquatic ecosystems and does not have any affect in their temperature or flow patterns.</i> |
| <i>Altering coastal dynamics, including erosion, sedimentation, or changes in sea levels?</i> | No | <i>The project is not located close to the coastline.</i> |
| <i>Displacing or negatively impacting wetland habitats, affecting the unique biodiversity and ecosystem services provided by wetlands?</i> | No | <i>The project is not located close to any wetland.</i> |
| <i>Altering river flow patterns, potentially leading to downstream impacts on water availability, sediment transport, and ecosystems?</i> | No | <i>The project does not imply spilling waste or any other negative activity in rivers.</i> |
| <i>Depleting aquifers and groundwater resources as a result of the project's activities, impacting local water supplies and ecosystem sustainability?</i> | <i>Potentially</i> | <i>The three lixiviation pools constructed collect rain water to avoid having to use water from reservoirs and aquifers.</i> |
| <i>Mountainous terrains, including changes in snowmelt patterns, glacier dynamics, or alterations in water runoff?</i> | No | <i>The project does not take place in mountainous habitats.</i> |

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| <i>Disrupting lake ecosystems, including changes in water quality, nutrient levels, or habitat disturbance?</i> | No | <i>The project does not take place close to lakes.</i> |
| <i>Contributing to ocean acidification, with potential consequences for marine life and coral reef ecosystems?</i> | No | <i>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.</i> |

Biodiversity and ecosystem

| <i>Could the project/initiative activities potentially entail or result in:</i> | <i>Response</i> | <i>Mitigation or preventive action</i> |
|---|-----------------|---|
| <i>Habitat destruction or fragmentation, impacting biodiversity by reducing available habitats for various species?</i> | No | <i>The project does not compromise the viability of species around the project area and does not used chemicals, fertilizers or other potentially dangerous substances.</i> |
| <i>Introducing invasive species, which could negatively affect native flora and fauna and disrupt local ecosystems?</i> | No | <i>The project activity does not imply any introduction of foreign species.</i> |
| <i>Altering ecosystem dynamics, including changes in species composition, trophic interactions, or nutrient cycles on the environment?</i> | No | <i>The project does not impact ecosystem dynamics.</i> |
| <i>Disrupting migration patterns for wildlife species, such as birds, mammals, or aquatic organisms?</i> | No | <i>The project does not interfere with migration habits because it does not significantly transform or modified the previous natural conditions.</i> |
| <i>Chemical contamination or pollution negatively impacting biodiversity in soil, water, or air?</i> | No | <i>The project does not use chemicals in the composting process.</i> |
| <i>Overexploiting natural resources, such as timber, water, or other materials, leading to declines in biodiversity and ecological balance?</i> | No | <i>The project used organic wastes as raw material without extracting new resources.</i> |
| <i>Overharvesting species at rates faster than they can actually sustain themselves in the wild?</i> | No | <i>The project activity does not required harvesting</i> |

| | | |
|---|----|--|
| <i>Climate change-induced impacts on biodiversity, including shifts in species distributions, changes in phenology, or increased vulnerability to extreme weather events?</i> | No | <i>The project helps with solid waste treatment reducing the amount of GHG release.</i> |
| <i>Negatively impacting endangered or threatened species within the project area, either directly or indirectly through habitat changes or other disturbances?</i> | No | <i>The project does not interfere with any endangered species.</i> |
| <i>Reducing genetic diversity within populations, potentially leading to decreased resilience and adaptability of species in the face of environmental changes?</i> | No | <i>The project does not interact, fragmented or endangered natural ecosystems.</i> |
| <i>Inadequate monitoring and assessment of biodiversity within the project area, making it Challenging to identify and address changes over time?</i> | No | <i>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.</i> |
| <i>Pressure on vulnerable ecosystems?</i> | No | <i>The project is not located in a vulnerable ecosystem.</i> |

Climate Change

| <i>Could the project/initiative activities potentially entail or result in:</i> | <i>Response</i> | <i>Mitigation or preventive action</i> |
|---|-----------------|---|
| <i>Increasing greenhouse gas emissions?</i> | No | <i>The project activity avoids greenhouse gas emissions when compare to the baseline scenario.</i> |
| <i>changes in habitat suitability for species due to climate change impacts, leading to shifts in species distributions or loss of critical habitat?</i> | No | <i>The project does not significantly modify the habitat of the project area.</i> |
| <i>disrupt ecosystem services provided by biodiversity, such as pollination, water purification, and carbon sequestration, affecting overall ecosystem functioning?</i> | No | <i>Within the project area there is a surrounding vegetal barrier with local species that avoid creating barriers to pollinizers or other ecosystems functions.</i> |
| <i>the spread of invasive species, leading to competition with native</i> | No | <i>The project does not require the introduction of any new species.</i> |

| | | |
|---|-------------|--|
| <i>species and alteration of ecosystem dynamics?</i> | | |
| <i>increased frequency or intensity of extreme weather events, such as storms, droughts, or floods, which can damage habitats and threaten species survival?</i> | Potentially | <i>To avoid the threat of floods, three lixiviation pools recover the rain water in the project area.</i> |
| <i>alteration of the phenology and behavior of species, affecting reproductive cycles, migration patterns, and interactions with other species, disrupting ecosystem dynamics?</i> | No | <i>The project does not interfere with migration cycles or natural ecosystem dynamics.</i> |
| <i>reducing genetic diversity within species populations due to climate change-induced habitat loss or fragmentation, compromising the adaptive capacity of populations to environmental stressors?</i> | No | <i>The project does not compromise the surrounding ecosystem.</i> |
| <i>exacerbation the prevalence of diseases and pathogens among wildlife populations, leading to population declines and ecosystem destabilization?</i> | Potentially | <i>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 °C that eradicates them.</i> |
| <i>weakening the resilience of ecosystems to disturbances, making them more susceptible to collapse or regime shifts, with cascading effects on biodiversity and ecosystem function?</i> | No | <i>The project activity does not compromise ecosystem resilience by composting non-hazardous organic matter.</i> |
| <i>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?</i> | No | <i>The project activity does not require a specific ecosystem to be feasible and is located close to urban areas where the potential affection to species is significantly smaller.</i> |
| <i>habitat loss, pollution, and overexploitation, amplifying the impacts on biodiversity and complicating conservation efforts?</i> | No | <i>The project activity does not extract natural resources and the modifications in habitat is minimum because all the infrastructure required is temporary.</i> |

Labor and Working Conditions

| <i>Could the project/initiative activities potentially entail or result in:</i> | <i>Response</i> | <i>Mitigation or preventive action</i> |
|--|-----------------|---|
| <i>forced labour, or human trafficked labour</i> | No | <i>All the contracts are redacted according to labour laws in Argentina.</i> |
| <i>child labour or forced labour practices during the project, either directly or within the project's supply chain?</i> | No | <i>Child labour is illegal and prosecuted in Argentina, none of the companies of the supply chain condone it or participate in it.</i> |
| <i>unsafe working conditions, exposing project stakeholders to potential hazards or accidents before, during and after the implementation of the activities?</i> | No | <i>To ensure a correct functioning of the project there is an internal safety manual and specific formation to the employees.</i> |
| <i>exploitative labour practices, such as inadequate wages, excessive working hours, or poor working conditions for the personnel engaged during the project activities?</i> | No | <i>Regular inspections take place to renovate the environmental authorization and includes relevant aspects of labour conditions.</i> |
| <i>discrimination in employment, including unequal opportunities, biased hiring practices, or unfair treatment based on factors such as gender, ethnicity, or other characteristics?</i> | No | <i>Human resources have protocols to ensure and protect all the workers regardless their gender, ethnicity or any other characteristic.</i> |
| <i>violating workers' rights, including issues related to freedom of association, collective bargaining, or other fundamental labour rights during the project's activities?</i> | No | <i>Regular inspections take place to renovate the environmental authorization and includes relevant aspects of labour conditions.</i> |
| <i>unfair treatment, exploitation, or inadequate protections for contractual workers or migrant laborers?</i> | No | <i>Regular inspections take place to renovate the environmental authorization and includes relevant aspects of labour conditions.</i> |
| <i>Inadequate grievance mechanisms, making it challenging for workers to address concerns, report issues, or seek resolution for labour- related problems?</i> | No | <i>Human resources have protocols to ensue and protect all the workers regardless their gender, ethnicity or any other characteristic.</i> |
| <i>insufficient social welfare support, such as healthcare, insurance, or</i> | No | <i>All the contracts are redacted according to labour laws in Argentina.</i> |

| | | |
|--|----|---|
| <i>other benefits for workers engaged in project activities?</i> | | |
| <i>displacement or negative impacts on local communities due to labour-related issues, including challenges related to employment opportunities and livelihoods?</i> | No | <i>The project activity is an opportunity for local employment and hiring from the surrounding areas is considered a good practice.</i> |
| <i>lack of training</i> | No | <i>The health and safety measurements in place also include training exercises.</i> |

Gender equality and Women empowerment

| <i>Could the project/initiative activities potentially entail or result in:</i> | <i>Response</i> | <i>Mitigation or preventive action</i> |
|--|-----------------|--|
| <i>gender-based discrimination in employment opportunities, recruitment processes, or access to leadership positions, hindering women's participation and advancement?</i> | No | <i>All recruitment processes focus on merit and capability without discrimination or gender consideration</i> |
| <i>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?</i> | No | <i>All project benefits and resources are equally distributed among the working personnel</i> |
| <i>limited participation and representation of women in project activities, consultations, or community engagements, potentially marginalizing their voices and perspectives?</i> | Potentially | <i>Manual labour jobs tend to attract 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.</i> |
| <i>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?</i> | No | <i>This project does not transform the dynamics of the area and local communities.</i> |
| <i>limited access to education, training, or capacity-building opportunities for women and girls, inhibiting their ability to develop skills and pursue</i> | Potentially | <i>The project develops collaboration programs with public university students with a high percentage of</i> |

| | | |
|---|-------------|---|
| <i>leadership roles within the project or related industries?</i> | | <i>women to develop new methodologies and foster innovation in the sector.</i> |
| <i>gender-based violence or harassment occurring within project settings or project- affected communities, affecting women's safety, well-being, and ability to participate fully?</i> | No | <i>The project activity and the community where is set up do not increase or affect women ' s safety.</i> |
| <i>inequitable access to land, natural resources, or economic opportunities, particularly disadvantaging women in rural or indigenous communities affected by land use changes?</i> | No | <i>The project does not imply a land use change that could potentially create disadvantages for women in rural areas.</i> |
| <i>underrepresentation of women in decision-making processes, including planning, governance structures, or stakeholder consultations, leading to less inclusive and effective outcomes?</i> | No | <i>The stakeholder ' s consultations and relationships are developed through public entities where women are significantly represented</i> |
| <i>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?</i> | Potentially | <i>The HR department include especial policies to ensure women ' s safety and an inclusive workspace to foster women empowerment.</i> |
| <i>limited economic empowerment and livelihood opportunities for women, such as access to credit, entrepreneurship support, or income-generating activities, within project-affected communities?</i> | No | <i>The economic conditions and credit access in the area is similar for all genders.</i> |
| <i>health and safety risks that disproportionately affect specific genders within the community, potentially leading to disparate impacts on men and women?</i> | No | <i>The project activity does not imply different safety risk for men and women</i> |
| <i>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?</i> | No | <i>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.</i> |
| <i>inadequate gender analysis and monitoring mechanisms, resulting in</i> | No | <i>The HR department include especial policies to ensure women ' s safety</i> |

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| <i>a lack of understanding of gender dynamics and missed opportunities for promoting gender equality and women empowerment?</i> | | <i>and an inclusive workspace to foster women empowerment.</i> |
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Land Acquisition, Restrictions on Land Use, Displacement, and Involuntary Resettlement

| <i>Could the project/initiative activities potentially entail or result in:</i> | <i>Response</i> | <i>Mitigation or preventive action</i> |
|---|-----------------|--|
| <i>Conflict over land resources and/or rights, such as competition for space between different land uses, communities, or stakeholders affected by the project?</i> | No | <i>Project land was available for sale and its acquisition did not create any conflict.</i> |
| <i>land acquisition, leading to changes in land ownership patterns and potential conflicts with local communities and landholders?</i> | No | <i>Land acquisition did not change the local dynamics and land distribution.</i> |
| <i>imposing restrictions on traditional land use practices, affecting the livelihoods and cultural practices of communities in the project area?</i> | No | <i>The scale of the project does not compromise any other activities in the area and is compatible with the economic activities traditionally developed.</i> |
| <i>displacing communities or residents from their homes and lands, leading to social, economic, and cultural disruptions?</i> | No | <i>Project implementation does not require displacing any community members.</i> |
| <i>involuntary resettlement or relocation of communities, impacting their access to resources, services, and community networks?</i> | No | <i>Project implementation does not require displacing or resettle any community member.</i> |
| <i>communities losing their livelihoods and agricultural productivity as a result of land acquisition or restriction on land use?</i> | No | <i>Project implementation does not limit the agricultural productivity it improves it by generating a high-quality organic fertilizer.</i> |
| <i>insufficient compensation and benefits for affected communities and individuals, leading to economic hardships and social discontent?</i> | No | <i>Project activity does not affect local communities to the point of making a compensation needed.</i> |
| <i>lack of free, prior, and informed consent from affected communities, potentially resulting in conflict and challenges to project implementation?</i> | No | <i>Part of the administrative process to obtain public authorizations includes a public notification.</i> |

| | | |
|---|----|--|
| <i>social and cultural disintegration within displaced communities, leading to the erosion of social cohesion and cultural practices?</i> | No | <i>Project scale and implementation process do not imply any community displacement.</i> |
| <i>communities losing access to common resources, such as forests, water bodies, or grazing lands, due to land acquisition or use restrictions?</i> | No | <i>The land where the project is located was not public property.</i> |
| <i>inadequate resettlement plans, potentially leading to insufficient support, services, and infrastructure for resettled communities?</i> | No | <i>Project scale and implementation process do not require any resettlement plans.</i> |

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 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 map in Figure 7 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 7.

Community health and safety

| <i>Could the project/initiative activities potentially entail or result in:</i> | <i>Response</i> | <i>Mitigation or preventive action</i> |
|---|-----------------|---|
| <i>exposure to hazardous materials, chemicals, or pollutants, potentially leading to adverse health effects or life-threatening risks?</i> | No | <i>The project activity does not use any hazardous or chemical substance.</i> |
| <i>degrading air quality in the project area due to emissions, dust, or other airborne pollutants?</i> | Potentially | <i>To avoid the effects of dust, roads are periodically irrigated.</i> |
| <i>water contamination, including pollution of water sources or reduced access to clean water, affecting community health and well-being?</i> | Potentially | <i>There are several phreatic wells within the installations and water quality control analysis are conducted regularly</i> |
| <i>increased noise levels or vibrations resulting from project operations,</i> | Potentially | <i>There is a vegetal barrier (trees and bushes) surrounding the project area</i> |

| | | |
|---|--------------------|---|
| <i>potentially causing disturbances and health impacts for nearby communities?</i> | | <i>to minimize the effects of noise produce by trucks and machinery.</i> |
| <i>traffic accidents or road safety hazards associated with increased traffic flow or transportation activities related to the project?</i> | <i>Potentially</i> | <i>Roads leading to the project installations are periodically maintained to ensure safety driving conditions.</i> |
| <i>workers exposure to hazardous conditions, physical attacks or inadequate safety measures?</i> | <i>No</i> | <i>There is a safety manual and specific training in place.</i> |
| <i>increased prevalence of vector- borne diseases or pest infestations as a result of changes in environmental conditions or habitat disruption?</i> | <i>No</i> | <i>Project scale does not create any significant habitat disruption.</i> |
| <i>community displacement or involuntary resettlement, leading to social disruption, stress, and negative health outcomes?</i> | <i>No</i> | <i>The project does not create any displacement.</i> |
| <i>community mental health and well-being, including stress, anxiety, and social isolation resulting from changes in living conditions or community dynamics?</i> | <i>No</i> | <i>The project does not affect the community dynamic.</i> |
| <i>Inadequate emergency preparedness and response mechanisms, leading to challenges in managing and mitigating potential health and safety emergencies?</i> | <i>No</i> | <i>There is a safety manual and specific training in place.</i> |
| <i>changes in land use patterns, such as increased exposure to disease vectors or decreased access to natural resources essential for health?</i> | <i>No</i> | <i>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.</i> |
| <i>inadequate health infrastructure and services in the project area, leading to challenges in addressing community health needs and emergencies?</i> | <i>No</i> | <i>The area has the capability to take care of health needs with several hospitals located less than an hour away.</i> |

Corruption

| <i>Could the project/initiative activities potentially entail or result in:</i> | <i>Response</i> | <i>Mitigation or preventive action</i> |
|---|-----------------|--|
| <i>funds allocated for the project/initiative being misappropriated or embezzled through fraudulent practices or kickbacks?</i> | No | <i>All the finds have been allocated by the project partners trough clean and transparent channels.</i> |
| <i>bribery or kickbacks being solicited or offered to secure contracts, permits, or other project-related approvals?</i> | No | <i>All project related approvals have followed the public channels and administrative requirements.</i> |
| <i>nepotism or favoritism in the selection of contractors, suppliers, or project personnel, compromising the integrity and fairness of procurement processes?</i> | No | <i>All selection process has been conducted by merit and adequacy of the requirements and the candidate.</i> |
| <i>fraudulent reporting or manipulation of project data, such as inflating project costs or overstating achievements, to obtain additional funding or meet performance targets?</i> | No | <i>No additional funding has been required to start the project.</i> |
| <i>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?</i> | No | <i>There is not external financing that could lead to conflict of interest.</i> |
| <i>lack of transparency in project decision-making processes, budget allocations, or contract awards, leading to suspicions of corruption or malpractice?</i> | No | <i>Significant changes in business operation required public authorization base on the nature of the project granting transparency and an audited transition.</i> |
| <i>weak regulatory oversight or enforcement mechanisms, allowing for corrupt practices to go undetected or unaddressed within project/initiative activities?</i> | No | <i>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.</i> |
| <i>undue influence or pressure exerted by external parties, such as political figures or industry lobbyists, to sway project decisions or gain unfair advantages?</i> | No | <i>Composting industry does not move enough resources or influence to be subjected to lobbying practices.</i> |

| | | |
|---|----|--|
| <i>Inadequate accountability mechanisms or whistleblower protection, discouraging individuals from reporting instances of corruption or unethical behavior?</i> | No | <i>There are legal mechanism and safety measures to ensure the protection of individuals reporting unethical behavior in Argentina.</i> |
| <i>corruption in the environmental permitting process, such as officials accepting bribes to overlook environmental violations or grant permits unlawfully?</i> | No | <i>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.</i> |
| <i>Corruption within subcontracting relationships, such as subcontractors paying bribes to secure favorable terms or win subcontracting opportunities?</i> | No | <i>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.</i> |

Economic impact

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

| | | |
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| <i>project-related developments, such as infrastructure projects or influxes of external workers?</i> | | |
| <i>inequitable distribution of benefits, leading to disparities in wealth, income, or access to resources among different segments of the population?</i> | No | <i>The scale of the project does not have the capability to impact wealth distribution in the region.</i> |
| <i>losing traditional economic practices and knowledge systems, potentially undermining cultural heritage and resilience to economic shocks in communities?</i> | No | <i>The project does not compromise cultural heritage and resilience to economic shocks because it does not eradicate or substitute traditional activities.</i> |
| <i>negatively impacting small-scale enterprises or informal economies that rely on natural resources or ecosystem services?</i> | No | <i>It creates new opportunities to small businesses to provide new services and create new synergies.</i> |
| <i>financial uncertainties, such as project delays, budget overruns, or changes in funding sources, affecting investment confidence and economic stability?</i> | No | <i>The project has already prove to be stable and growing.</i> |
| <i>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?</i> | No | <i>A small-scale compost project cannot affect the access to financial resources.</i> |
| <i>lack of economic resilience and adaptive capacity within project-affected communities, particularly in response to external shocks or long-term changes in market conditions?</i> | No | <i>The number of workers and employees are not significant enough to modify the community economic resilience.</i> |
| <i>inadequate compensation or mitigation measures for economic impacts, such as loss of assets or disruptions to income streams, experienced by individuals or communities?</i> | No | <i>The project does not require compensation measures.</i> |

Governance and Compliance

| <i>Could the project/initiative activities potentially entail or result in:</i> | <i>Response</i> | <i>Mitigation or preventive action</i> |
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| <i>Insufficient institutional capacity within project/initiative implementing agencies or partner organizations, leading to challenges in effective governance and project management?</i> | No | <i>The project has already been established and function proving its institutional capacity</i> |
| <i>weak governance structures and mechanisms within the project/initiative, such as unclear roles and responsibilities, inadequate decision-making processes, and limited transparency and accountability?</i> | No | <i>Base on the nature of the activity developed, the project is subjected to periodic audition process.</i> |
| <i>Inadequate stakeholder engagement and participation in project/initiative decision- making processes, leading to governance gaps and reduced project legitimacy?</i> | Potentiall y | <i>Stakeholder consultation and engagement activities are conducted to ensure a good relationship.</i> |
| <i>ineffective or inadequate regulatory frameworks governing project activities, resulting in loopholes, inconsistencies, or gaps in environmental protection and governance standards?</i> | No | <i>Regulatory framework in waste treatment is established enough to avoid inefficiencies.</i> |
| <i>delays or challenges in obtaining necessary permits, licenses, and approvals for project activities due to regulatory complexities, bureaucratic inefficiencies, or legal requirements?</i> | Potentiall y | <i>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.</i> |
| <i>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?</i> | No | <i>Waste treatment is always a public interest regardless of political changes and the project gives a viable solution to that issue.</i> |
| <i>non-compliance with relevant laws, regulations, permits, and international agreements governing GHG emissions, biodiversity conservation, environmental protection and land use</i> | No | <i>All the legal authorizations were obtained before the activity started and the environmental authorization is periodically renovated.</i> |

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| <i>management, leading to legal challenges and reputational risks?</i> | | |
| <i>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?</i> | No | <i>There is not external financing that could lead to conflict of interest.</i> |
| <i>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?</i> | No | <i>The Argentinian state grants the right to its citizens to access justice.</i> |
| <i>insufficient monitoring and evaluation mechanisms to assess project performance, impacts, and compliance with governance standards, leading to gaps in accountability and learning?</i> | No | <i>The environmental authorization of the company is periodically renovated and a full audition of the project is required.</i> |
| <i>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?</i> | No | <i>Local governments and public administration are the ones that ultimately supervise the project activity by granted the permissions and authorizations heavily influencing the decision-making processes.</i> |

9 Stakeholder engagement and consultation

By actively involving stakeholders and listening to their concerns and aspirations, Hisoil can develop sustainable practices that not only minimize negative impacts but also generate long-term value for both the business and society. Hisoil makes a general mapping of social organizations and analysis of the impacted areas to evaluate which ones we identify with and begin to generate networks and joint projects, the main stakeholders categories are:

- Local community

- Local authorities
- National and Regional authorities
- Workers
- Suppliers
- Customers
- Professional associations
- University

Hisoil has analyzed the main socio-economic effects of its activities. Before the start of the process, an analysis of the demographic and labor population in the immediate surroundings was carried out, with the following main results:

Close population: the installations are more than 2 kilometers from the nearest population center, there is no houses nearby.

- *Neighborhood conditions: the boundaries of Hisoil are farmland and other companies. The access roads to the facilities are made of dirt, which can lead to dust being raised when entering. Local communities with economical and employment challenges.*
- *Indigenous communities or traditional territories: 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.*

Considering this initial situation, the socioeconomic effects of this project are:

- Improvement of the environment.*
- Increase in local employment.*
- Give a second life to the waste generated by neighboring companies.*

All these impacts are positive, not generating relevant negative effects, so following the BCR tool No Net Harm, no corrective actions and measures are established.

The project activities do not cause harm to local communities or society in general.

Hisoil has formal and regular processes for gathering information from stakeholders (focus groups, surveys, community meetings, neighbors, authorities, 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.

Hisoil has made a consultation with the principal stakeholders. All the information of the project can be consulted in our website <https://hisoil.com.ar/> or in our social media: Instagram, Twitter, LinkedIn and Facebook. These platforms remain open throughout the project to facilitate access to all information related to the project, as well as its potential environmental and social effects.

All stakeholders have been consulted and are invited to provide comments. Appropriate mechanisms are also in place for them to provide comments on an ongoing basis throughout the project development. All stakeholders are involved in the process in an appropriate manner.

The stakeholders detected and their influence on the project are following:

Local community:

Although the company is located more than 2 kilometers from the nearest population and considering that there are no indigenous populations in the area, Hisoil believes it is important to improve its immediate surroundings and create a positive impact on the local community.

The actions to include all the interested parties by the local community are:

- Yearly meetings: by having yearly meetings with local authorities and with neighbors to discuss the different actions that can be taking to support different initiatives.*
- Visits to the premises: by organizing visits to the premises in order to create awareness about the project and the positive impact.*

Minutes are taken from all these meetings, signed by both parties, which record all the suggestions, complaints from the community and all the actions that Hisoil will take to resolve them.

- *Suggestion book: also, the company has and implemented a book of complaints and suggestions and a suggestion box as well open to the community in the area where the non-hazardous organic waste processing plant is located. This book reflects that there have been no comments since the beginning of the project.*

Local Authorities:

The local authorities have a big influence in the authorizations and regulations of the project activity. Hence, Hisoil maintains a close relationship with local authorities through different mechanisms: by having regular meetings to get the licenses and all necessary local authorizations, before the project start, and therefore every time that needs renovation, also every year by visiting the municipality and asking them for direct feedback.

In addition to the regular meetings held with local authorities regarding the licenses and authorizations required to develop the project, numerous visits have also been made to the facilities over the years.

National and Regional 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.

Workers:

The company has a commitment to workers, considering them as key agents in the creation of social and environmental value.

Hisoil strives to provide a friendly environment in which people can evolve, contribute, accept challenges, develop themselves by fulfilling their goals and those of the company. Also, the company values the talents and abilities of its employees and seeks to foster an open, cooperative and dynamic environment in which both they and the company can thrive. The actions and mechanisms that are taken to promote, include and interact with employees are the following:

- *Employee handbook: the purpose of the employee handbook is to inform Hisoil general policies, standards, procedures and benefits. This handbook helps the organization to have a more effective and efficient operation, to maintain an optimal work environment for all employees and to generate awareness of why our company exists.*

- *Inclusive searches mechanism and recruitment policy: Hisoil encourages the search for professionals and collaborators who are promoters of a corporate and social culture, committed to caring for the environment and that contemplates integration without distinction of gender, sexual preferences, different abilities, ideology, religion. Also, Hisoil prioritizes hiring local workers what means the 66% of the employees are living locally.*

- *Complaints and suggestions mailbox: this mechanism allow workers give inputs and comments anonymously regarding any topic that is important for them and can contribute to a better every day for all.*

All these actions allow to collect workers' point of view of the project on an ongoing basis.

Suppliers:

Counting on products that are not raw material of these project, most of the suppliers are local, contributing to the improvement of socio-economic conditions in the local community. Besides, all waste suppliers are located less than 200 km around the installations of the project.

Hisoil has a continuous communication process and open communication channels with its suppliers to receive complaints and suggestions and to show closeness and transparency.

Hisoil shares as well knowledge to create awareness about the project and its impact on the environment, sending samples of the final products, and giving direct information about the process from waste to compost.

To date, no comments have been received from suppliers. In fact, Hisoil. has always received praise when presenting and signing the agreements, given its great commitment to the planet and society.

Customers:

As the 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.

- Professional associations: Hisoil is an active member of ASACOMP and participates in many events as a speaker at professional meetings. Also has received different visits, from other companies and associations (Las Marias, Cooperativa Ruo Caba). This participation gives Hisoil the opportunity to receive feedback and to get information about good examples from other members.

- 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 organized different visits to the company to explain the project and the positive impact on the society and the environment. Receiving students and teachers and collaborating with an agreement in future projects to improve the processes of composting, gives Hisoil the opportunity to get feedback and to improve the positive impact and correct any negative one.

9.1 Summary of comments received

From these meetings with the local community was raised the concern about the situation of the road that goes to the premises due the intensive traffic and meteorological impact.

Hisoil has also received different comments from workers to improve their experience and to improve the company operations. Even if these comments are quite detailed, are really important for the workers. As example:

Improve lighting in the chemical bath

Workers mobility to the premises, they ask for new solutions.

Extra mobile to improve the operation between departments.

Behaviors in the employee canteen, as people do not behave always as they should.

Other comments are positive ones and keep encouraging Hisoil to continue with their activities.

9.2 Consideration of comments received

From these meetings with the local community, 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 as reflected in the minutes taken from all these meetings, signed by both parties, which record all the suggestions, complaints from the community and all the actions that Hisoil will take to resolve them.

From the comments received from Workers, these are the actions that Hisoil has taken:

Improve lighting in the chemical bath: Battery lighting added

Workers mobility to the premises, they ask for new solutions: Not public bus goes to the premises and the won't in the future, so Hisoil is actively promoting shared transport between workers, as well facilitating loans to buy cars or motorbikes to the employees.

Extra mobile to improve the operation between departments. It has been bought.

Behaviors in the employee canteen, as people do not behave always as they should. Different actions has been taken in this point, lockers for workers, communication regarding the importance of the order and meeting from the management with all workers to reinforce the message.

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 neighbouring population regarding the treatments it carries out without generating Odors, which brings about social unrest.

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 the 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 in 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.

All communication channels remain open to achieve continuous improvement and to maintain the good work of the project.

10 Sustainable Development Goals (SDGs)

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) annexed to this PDD, 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 | 1/august/2023 to 31/July/2026 | 1/august/2026 to 31/July/2029 |
| 8.8.1. Number of fatal and non-fatal occupational injuries. | 5 | 4 | 3 |

- **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 | 1/august/2023 to 31/July/2026 | 1/august/2026 to 31/July/2029 |
| 9.5.1 Number of visits and collaboration programs developed | 2 | 4 | 5 |

– **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 | 1/august/2023 to 31/July/2026 | 1/august/2026 to 31/July/2029 |
| 11.6.1 Tons of organic urban solid wastes treated. | 113,328.30 | 112,412.13 | 112,412.13 |

– **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 | 1/august/2023 to 31/July/2026 | 1/august/2026 to 31/July/2029 |
| 12.5.1 Tons of waste reuse in the composting process | 113,328.30 | 112,412.13 | 112,412.13 |

– **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 | 1/august/2023 to 31/July/2026 | 1/august/2026 to 31/July/2029 |
| 13.2.1 Tons of CO ₂ equivalent emissions avoided thanks to the project activity | 38.780 | 36.951 | 36.951 |

11 REDD+ Safeguards (For REDD+ projects)

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

12 Special categories, related to co-benefits (optional)

Not applicable because it's not a special category.

13 Grouped projects (if applicable)

Not applicable because it's not a grouped project.

14 Other GHG program

The project is not registered under any other GHG program.

15 Double counting avoidance

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.

16 Monitoring plan

16.1 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.

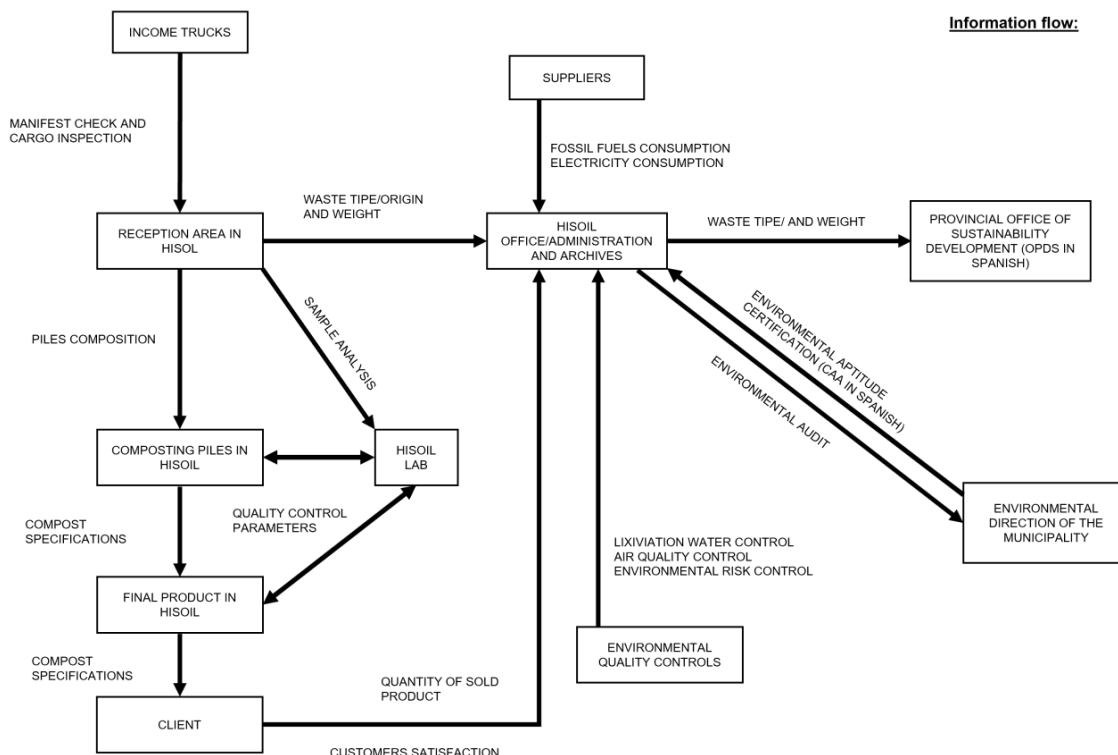


Figure 8. Information flow of Hisoil's project.

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 Municipality 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 | <ul style="list-style-type: none"> - 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 | <ul style="list-style-type: none"> - 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. |

| | |
|--------------------------------|---|
| <i>Internal truck movement</i> | - 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 |
|-----------------------------------|--|
| <i>Fuel consumption reduction</i> | <ul style="list-style-type: none"> - 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. |
| <i>Energy efficiency</i> | - 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 - 30 °C.

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 contidion 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. ($EF_{CH_4, y}$). 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 ($EF_{N_2O, y}$). 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_{N_2O}). Official source: Global Warming Potential Values - Greenhouse Gas Protocol, adapted from the IPCC Fifth Assessment Report, 2014 (AR5).*
 - *Global Warming Potential of Methane (GWP_{CH_4}). 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 Statistics.*
- *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) (DOC_j) 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.

Project Impact

The following section summarizes all the parameters monitored to control the project impact in environmental and social aspects, as well as the contribution to the Sustainable Development Goals and the Sustainable Development Safeguards.

a) Information related to the environmental impact assessment of the GHG project activities.

The information regarding the environmental impact assessment could be segregated depending on the natural resource impacted.

| <i>Resource</i> | <i>Impact</i> |
|-----------------|--|
| <i>Water</i> | <i>Phreatic wells monitoring and control to grant water quality.</i> |
| <i>Air</i> | <i>Installed Volatile Organic Compounds detectors to measure, control and verify air quality.</i> |
| <i>Soil</i> | <i>Lixiviation pools located to drain levels and runoff lines to avoid possible contamination.</i> |

All this information will be gathered according to the procedures complying with the requirements of the periodic environmental audition for the Annual Environmental Authorization (CAA in Spanish) required to manage waste in Argentina according to legislation.

b) Procedures for assessing the project's contribution to the Sustainable Development Goals (SDGs).

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:

| <i>SDG</i> | <i>Procedure</i> |
|---|--|
| <i>8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.</i> | <i>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.</i> |
| <i>9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.</i> | <i>To carry out collaboration programs with public research and education entities to boost innovation and public-private collaboration in waste treatment and sustainable industries.</i> |
| <i>11. Make cities and human settlements inclusive, safe, resilient and sustainable.</i> | <i>To correctly treat urban solid wastes by a proper separation and destination to a recycling process by composting them.</i> |
| <i>12. Ensure sustainable consumption and production patterns.</i> | <i>Recycle of every suitable residue collected in Hi-soil through a composting process.</i> |
| <i>13. Take urgent action to combat climate change and its impacts.</i> | <i>To monitor and control the emissions avoided by composting organic waste instead of its deposition in landfills.</i> |

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

| <i>Criteria and indicators</i> | <i>Measure (unit)</i> |
|---|--|
| <i>8.8.1 Frequency rates of fatal and non-fatal occupational injuries, by sex and migrant status.</i> | <i>Number of fatal and non- fatal occupational injury reduction.</i> |

| | |
|---|--|
| 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 final discharge out of total urban solid waste generated, by cities. | Tons of organic urban solid wastes treated. |
| 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. |

- d) Detailed information necessary for monitoring project activities, assessing mitigation and preventive results, and conducting quality control of measurements and quantification related to the Sustainable Development Safeguards (SDSs) tool assessment:

| | |
|--|---|
| The project/initiative activities potentially entail or result in: | Measures for monitoring the mitigation or preventive action |
|--|---|

| | |
|---|--|
| <i>Air and water pollution resulting from project-related emissions, discharges, or improper waste disposal practices</i> | <i>Annual laboratory analysis of the parameters checked by the three air quality measure stations in the installations.</i> |
| <i>Inefficient resource use, including energy, water, and raw materials, leading to increased environmental footprint.</i> | <i>Lab quality controls of compost humidity temperature and pH to determine if it is necessary or not to flipped the piles</i> |
| <i>Disrupting natural drainage systems, leading to increased vulnerability to floods, soil erosion, or other hydrological issues.</i> | <i>Visual measure and monitorization of the water levels on the three lixiviation pools that collect rain water and prevent floods.</i> |
| <i>Water pollution, including contamination of rivers, lakes, oceans, or aquifers as a result of project-related activities such as emissions, spills, or waste disposal</i> | <i>Annual laboratory analysis of the relevant parameters to determine the water quality of the four phreatic wells build in the installations.</i> |
| <i>Limited participation and representation of women in project activities, consultations, or community engagements, potentially marginalizing their voices and perspectives</i> | <i>Number of women hired in HiSoil and annual percentual evolution of women working for the company.</i> |
| <i>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</i> | <i>Number of visits and collaboration programs with public university students with a high percentage of women to develop new methodologies and foster innovation in the sector.</i> |
| <i>Water contamination, including pollution of water sources or reduced access to clean water, affecting community health and well-being.</i> | <i>Annual laboratory analysis of the relevant parameters to determine the water quality of the four phreatic wells build in the installations.</i> |

| | |
|---|---|
| <i>Inadequate stakeholder engagement and participation in project/initiative decision- making processes, leading to governance gaps and reduced project legitimacy.</i> | <i>Annual consultations and maintenance of communication channels to ensure the fluent relationship with all stakeholders involved.</i> |
|---|---|

16.2 Data and parameters determined at registration and not monitored during the quantification period, including default values and factors

| Data / Parameter | $EF_{EF,j,y}$ | | | | | | | | | | | | |
|----------------------------|--|-------------|------------------------------|------|-------|------|-------|------|-------|------|--------|------|-------|
| Data unit | $t\ CO_2/MWh$ | | | | | | | | | | | | |
| Description | <i>Emission factor for electricity generation for source j in year y</i> | | | | | | | | | | | | |
| Source of data used | <i>Methodological tool 5 “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation “(version 3).</i> | | | | | | | | | | | | |
| Value (s) | <p><i>The emission factor for electricity generation are:</i></p> <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> | <u>Year</u> | $EF_{EF,j,y} (t\ CO_2e/MWh)$ | 2019 | 0.267 | 2020 | 0.275 | 2021 | 0.292 | 2022 | 0.2717 | 2023 | 0.231 |
| <u>Year</u> | $EF_{EF,j,y} (t\ CO_2e/MWh)$ | | | | | | | | | | | | |
| 2019 | 0.267 | | | | | | | | | | | | |
| 2020 | 0.275 | | | | | | | | | | | | |
| 2021 | 0.292 | | | | | | | | | | | | |
| 2022 | 0.2717 | | | | | | | | | | | | |
| 2023 | 0.231 | | | | | | | | | | | | |

| | <p>So, values applied $EF_{EF,j,y}$ for each period are an average of each year:</p> <table border="1"> <thead> <tr> <th><u>Year</u></th><th>$EF_{EF,j,y}$ (t CO₂e/MWh)</th></tr> </thead> <tbody> <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> <tr> <td>01/08/22-31/07/23</td><td>0.25135</td></tr> </tbody> </table> <p>For the estimation period since 1/august/2023 to 31/july/2029, the value for $EF_{EF,j,y}$ is the same as year 4: 0,25135 t CO₂e/MWh per year.</p> | <u>Year</u> | $EF_{EF,j,y}$ (t CO ₂ e/MWh) | 01/08/19-31/07/20 | 0.271 | 01/08/20-31/07/21 | 0.2835 | 01/08/21-31/07/22 | 0.28185 | 01/08/22-31/07/23 | 0.25135 |
|--|--|-------------|---|-------------------|-------|-------------------|--------|-------------------|---------|-------------------|---------|
| <u>Year</u> | $EF_{EF,j,y}$ (t CO ₂ e/MWh) | | | | | | | | | | |
| 01/08/19-31/07/20 | 0.271 | | | | | | | | | | |
| 01/08/20-31/07/21 | 0.2835 | | | | | | | | | | |
| 01/08/21-31/07/22 | 0.28185 | | | | | | | | | | |
| 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 | <i>IEA Statistics OECD/IEA 2018.</i> |
| Value (s) | <i>15%</i> |
| Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations) | <i>Determination of the project emissions</i> |
| Justification of choice of data or description of measurement methods and procedures applied | <i>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</i> |
| Additional comments | |

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

| | |
|----------------------------|--|
| Additional comments | |
|----------------------------|--|

| | |
|---|---|
| Data / Parameter | $EF_{FC,default}$ |
| Data unit | Tons of CO ₂ per tonne of waste (tCO ₂ e/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 the methodological tool number 13. |
| Additional comments | |

| | |
|----------------------------|---|
| Data / Parameter | $EF_{CH_4,y}$ |
| 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, $EF_{CO_4,y}$ (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 | $EF_{N_2O,y}$ |
| Data unit | t N ₂ O/ 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, $EF_{N_2O,y}$ (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 |

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| | <i>sources was analyzed and a value conservatively selected from the higher end of the range results.</i> |
| Additional comments | |

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|---|--|
| Data / Parameter | GWP_{N_2O} |
| 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 | <i>Year of the crediting period for which methane emissions are calculated (y is a consecutive period of 12 months)</i> |
| Source of data used | <i>Standard BCR app 11.5</i> |
| Value (s) | <i>10</i> |
| Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations) | <i>Determination of the baseline and project emissions.</i> |
| Justification of choice of data or description of measurement methods and procedures applied | <i>As explained in section 3.2.3. of this document, the project has a duration of 10 years, so $y = 10$.</i> |
| Additional comments | |

| | |
|---|---|
| Data / Parameter | ϕ_y |
| Data unit | - |
| Description | <i>Default value for the model correction factor to account for model uncertainties for year y.</i> |
| Source of data used | <i>Methodological tool 4 “Emission from solid waste disposal sites” version 08.1.</i> |
| Value (s) | <i>0.85</i> |
| Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations) | <i>Determination of the baseline and project emissions.</i> |

| | |
|---|---|
| Justification of choice of data or description of measurement methods and procedures applied | <p>As per para 19 of tool 4, the option chosed to calculate the model correction factor is option 1 (default value) because climatic conditions are provided by the Government of Buenos Aires.</p> <p>As per table 2 (page 7) and Data /Parameter table 1 (page 13) of the tool 4,for baseline emissions the default values for model correction factor depends on the application of the tool (A or B) and the climate where the SWDS is located.</p> <p>According to the national weather service (Servicio Meteorológico Nacional de Argentina in Spanish) and the Government of Buenos Aires, the climate in Buenos Aires, where the SWDS of Norte III is located is humid.</p> <p>Considering the climate and tthat he application is B, the value applied for ϕ_y as per Data/Parameter table 1 is 0,85.</p> |
| 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 | 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 f_y , we have to select the maximum |

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| <p>measurement methods and procedures applied</p> | <p>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.</p> <p>As there ' s no regulation requirements, the value for f_y 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.</p> <p>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. Maasackers 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".</p> <p>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.</p> <p>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</p> |
|--|---|

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|----------------------------|--|
| | <p>that these wastes will be treated appropriately in a controlled methane recovery area.</p> <p>Therefore, for all the above mentioned the project holder has decided to give f_y a value of 0%.</p> |
| Additional comments | |

| | |
|---|--|
| Data / Parameter | GWP_{CH_4} |
| 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 | <p>Global warming potential of methane valid for the relevant period.</p> <p>https://ghgprotocol.org/sites/default/files/Global-Warming-Potential-Values%20(Feb%2016%202016)_1.pdf</p> |
| Additional comments | |

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|-------------------------|----|
| Data / Parameter | OX |
| Data unit | - |

| | |
|---|--|
| Description | <i>Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)</i> |
| Source of data used | <i>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.</i> |
| Value (s) | 0.10 |
| Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations) | <i>Determination of the baseline</i> |
| Justification of choice of data or description of measurement methods and procedures applied | <i>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.</i> |
| Additional comments | |

| | |
|---|---|
| Data / Parameter | <i>F</i> |
| Data unit | - |
| Description | <i>Fraction of methane in the SWDS gas (volume fraction).</i> |
| Source of data used | <i>Methodological tool 4 “Emission from solid waste disposal sites” version 08.1. and IPCC 2006 Guidelines for National Greenhouse Gas Inventories.</i> |
| Value (s) | 0.5 |
| Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations) | <i>Determination of the baseline.</i> |

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|---|--|
| Justification of choice of data or description of measurement methods and procedures applied | <i>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.</i> |
| Additional comments | |

| | |
|---|---|
| Data / Parameter | $DOC_{f,y}$ |
| Data unit | weight fraction |
| Description | <i>Fraction of degradable organic carbon (DOC) that decomposes under the specific conditions occurring in the SWDS for year y.</i> |
| Source of data used | <i>Methodological tool 4 “Emission from solid waste disposal sites” version 08.1. and IPCC 2006 Guidelines for National Greenhouse Gas Inventories.</i> |
| Value (s) | 0.5 |
| Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations) | <i>Determination of the baseline.</i> |
| Justification of choice of data or description of measurement methods and procedures applied | <i>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 BPM_{MSW}. 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.</i> |
| Additional comments | |

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|---|--|
| Data / Parameter | MCF_y |
| Data unit | - |
| Description | <i>Methane correction factor for year y</i> |
| Source of data used | <i>Methodological tool 4 “Emission from solid waste disposal sites” version 08.1. and IPCC 2006 Guidelines for National Greenhouse Gas Inventories.</i> |
| Value (s) | <i>1.00</i> |
| Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations) | <i>Determination of the baseline.</i> |
| Justification of choice of data or description of measurement methods and procedures applied | <i>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.</i> |
| Additional comments | |

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|-------------------------|--|
| Data / Parameter | DOC_j |
| Data unit | - |
| Description | <i>Fraction of degradable organic carbon in the waste type j (weight fraction)</i> |

| | | |
|--|--|--|
| 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: | |
| | Waste type | DOC _j |
| | Wood and wood products | 43% |
| | Pulp, paper and cardboard (other than sludge) | 40% |
| | Food, food waste, beverages and tobacco (other than sludge) | 15% |
| | Garden, yard and park waste | 20% |
| | Sewage sludge | 5% |
| | Other putrescible | 20% |
| 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 the value depends on the waste type, justifications of each data are above: | |
| | Waste type | Justification |
| | Wood and wood products | For application B, and data / parameter table 6, Methodological tool 004 “ |

| | | |
|--|--|---|
| | | <i>Emissions from solid waste disposal sites” .</i> |
| | <i>Pulp, paper and cardboard (other than sludge)</i> | <i>For application B, and data / parameter table 6, Methodological tool 004 “Emissions from solid waste disposal sites” .</i> |
| | <i>Food, food waste, beverages and tobacco (other than sludge)</i> | <i>For application B, and data / parameter table 6, Methodological tool 004 “Emissions from solid waste disposal sites” .</i> |
| | <i>Garden, yard and park waste</i> | <i>For application B, and data / parameter table 6, Methodological tool 004 “Emissions from solid waste disposal sites” .</i> |
| | <i>Sewage sludge</i> | <p><i>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.</i></p> <p><i>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</i></p> |

| | | |
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| | | <p>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” .</p> |
| | Other putrescible | <p>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.</p> |
| Additional comments | | |

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|------------------|-------|
| Data / Parameter | 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) | <p>As depends on the waste type, the applied values are:</p> <table> <tr> <td>Waste type</td><td>k_j</td></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> | Waste type | k_j | Wood and wood products | 0.03 | Pulp, paper and cardboard (other than sludge) | 0.06 | Food, food waste, beverages and tobacco (other than sludge) | 0.185 | Garden, yard and park waste | 0.10 | Sewage sludge | 0.185 | Other putrescible | 0.10 |
| Waste type | k_j | | | | | | | | | | | | | | |
| Wood and wood products | 0.03 | | | | | | | | | | | | | | |
| Pulp, paper and cardboard (other than sludge) | 0.06 | | | | | | | | | | | | | | |
| Food, food waste, beverages and tobacco (other than sludge) | 0.185 | | | | | | | | | | | | | | |
| Garden, yard and park waste | 0.10 | | | | | | | | | | | | | | |
| Sewage sludge | 0.185 | | | | | | | | | | | | | | |
| Other putrescible | 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 | <p>Considering Data / Parameter table 7 of the methodological tool, since the project is in a boreal and temperate ($MAT \leq 20^{\circ} C$), Wet ($MAP/p ET > 1$), location, values depend on the waste type:</p> <table> <tr> <td>Waste type</td><td>Justification</td></tr> <tr> <td>Wood and wood products</td><td>For application B, and data / parameter table 7,</td></tr> </table> | Waste type | Justification | Wood and wood products | For application B, and data / parameter table 7, | | | | | | | | | | |
| Waste type | Justification | | | | | | | | | | | | | | |
| Wood and wood products | For application B, and data / parameter table 7, | | | | | | | | | | | | | | |

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|----------------------------|--|---|
| | | <i>Methodological tool 004 “Emissions from solid waste disposal sites” .</i> |
| | <i>Pulp, paper and cardboard (other than sludge)</i> | <i>For application B, and data / parameter table 7, Methodological tool 004 “Emissions from solid waste disposal sites” .</i> |
| | <i>Food, food waste, beverages and tobacco (other than sludge)</i> | <i>For application B, and data / parameter table 7, Methodological tool 004 “Emissions from solid waste disposal sites” .</i> |
| | <i>Garden, yard and park waste</i> | <i>For application B, and data / parameter table 7, Methodological tool 004 “Emissions from solid waste disposal sites” .</i> |
| | <i>Sewage sludge</i> | <i>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” .</i> |
| | <i>Other putrescible</i> | <i>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 .</i> |
| Additional comments | | |

16.3 Data and parameters monitored

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|---------------------------------------|---|
| Data / Parameter | $W_{j,x}$ or Q_j |
| Data unit | tonnes (t) |
| Description | <p>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).</p> <p>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.</p> <p>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.</p> <p>So, Q_y and W_j has the same values.</p> |
| Measured /Calculated /Default: | Measured by the project holder |
| Source of data | Measured by the project holder |

| <i>Value(s) applied</i> | | | <i>Food, food waste , bever ages and tobac co (other than sludg e)</i> | <i>Food waste/S ewage sludge</i> | <i>Other organ ic putre scible (non food)</i> | <i>Pulp, paper, cardbo ard...</i> | <i>Wood , wood produ ct</i> | <i>Total (ton)</i> |
|---|-----------------------------|---|--|--|---|---|---|------------------------|
| | <i>Waste (Wj) (ton)</i> | <i>Garde n, yard and park</i> | | | | | | |
| | 01/08/19- 31/07/20 | 1,093. 30 | 1,925.1 5 | 13,073.4 9 | 1,551.0 1 | 36.73 | 0.00 | 17,679 .67 |
| | 01/08/20- 31/07/21 | 2,254. 74 | 6,318. 63 | 19,278.1 8 | 777.9 3 | 176.83 | 11.86 | 28,818 .17 |
| | 01/08/21- 31/07/22 | 2,036. 20 | 5,368. 92 | 20,975. 43 | 663.6 8 | 243.22 | 72.30 | 29,35 9.75 |
| | 01/08/22- 31/07/23 | 2,288. 21 | 6,813. 85 | 27,735. 95 | 232.51 | 400.19 | 0.00 | 37,47 0.71 |
| | <i>Total</i> | 7,672. 44 | 20,42 6.55 | 81,063. 05 | 3,225.1 3 | 856.97 | 84.16 | 113,32 8.30 |
| <p><i>As the project is retroactive, the values for next years (since 01/08/2023 to 31/07/2029) are the same as last period quantified (since 01/08/2022 to 31/07/2023) per year.</i></p> <p><i>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;</i></p> | | | | | | | | |

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| | <i>“European Waste List”) and the specifications of the waste provider, which are verified by the project holder while performing the cargo control.</i> | | |
| <i>Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)</i> | <i>Determination of the baseline and determination of the project emission.</i> | | |
| <i>Monitoring frequency</i> | <i>Monitored continuously with the entrance of each truck at the plant.</i> | | |
| <i>Measuring/ Reading/ Recording frequency</i> | <i>Daily</i> | | |
| <i>Measurement/Calculation method (if applicable)</i> | <i>Not applicable</i> | | |
| <i>QA/QC procedures applied</i> | <i>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:</i> | | |
| | <i>CC Activity</i> | <i>Procedure to be performed</i> | <i>Com ply</i> |
| | <i>Review that assumptions and criteria for selecting activity data and emission factors are documented.</i> | <i>• Compare activity data descriptions and emission factors with information on source categories and ensure they are recorded and archived correctly.</i> | |

| | | | | | |
|--|---|--|--|--|--|
| | <p><i>Review data entries and references for transcription errors.</i></p> | <p><i>Confirm that bibliographic data references are correctly cited in internal documentation.</i></p> <p><i>Compare a sample of input data from each source category (measurements or parameters used in calculations) to see if there are transcription errors.</i></p> | | | |
| | <p><i>Check that the baseline and project scenario emissions have been calculated correctly.</i></p> | <p><i>Reproduce a representative sample of emissions reduction calculations.</i></p> <p><i>Selectively mimic complex model calculations with abbreviated calculations to judge their relative accuracy.</i></p> | | | |
| | <p><i>Check that the emission parameters and units are recorded correctly and that appropriate conversion factors are used.</i></p> | <p><i>Check that the units are properly labeled on the spreadsheets.</i></p> <p><i>Check that the units are carried correctly from the beginning to the end of the calculations.</i></p> <p><i>Check that the conversion factors are correct.</i></p> <p><i>Check that temporal and spatial adjustment factors are used correctly.</i></p> | | | |
| | <p><i>Examine the integrity of the database files.</i></p> | <p><i>Confirm that the appropriate stages of data processing are correctly represented in the database.</i></p> <p><i>Confirm that data relationships are correctly represented in the database.</i></p> | | | |

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| | | <p>Ensure that data fields are properly labeled and have the correct layout specifications.</p> <p>Ensure that sufficient documentation of the database and the structure and operation of the model has been archived.</p> | | | |
| | Examine data consistency across source categories. | <ul style="list-style-type: none"> 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. | | | |
| | Examine that the inventory data movement between process stages is correct. | <p>Examine that emissions data are correctly aggregated from lower reporting levels to higher reporting levels when preparing summaries.</p> <p>Check that emissions data are correctly transcribed between different intermediate products.</p> | | | |
| | Check that uncertainties in emissions reductions are correctly estimated or calculated. | <p>Examine the appropriateness of the qualifications of persons providing expert judgment on uncertainty estimates.</p> <p>Check that qualifications, assumptions and expert opinions are recorded. Check that calculated uncertainties are complete and have been calculated correctly.</p> <p>If necessary, repeat the error calculations or a reduced sample of the probability distributions used by the Monte Carlo analyses.</p> | | | |

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| | <p><i>Proceed with a review of internal documentation.</i></p> | <p><i>Examine that detailed internal documentation exists to support the estimates and allow for repeatability of the issuance and uncertainty estimates.</i></p> <p><i>Review that inventory data, supporting data, and inventory records are on file and stored to facilitate detailed review.</i></p> <p><i>Examine the integrity of all arrangements for archiving data from outside organizations involved in preparing the inventory.</i></p> | | | |
| | <p><i>Examine methodological and data changes that dictate recalculations.</i></p> | <p><i>Examine temporal consistency in the time series input data for the project.</i></p> <p><i>Examine the consistency of the algorithm/method used for calculations across the time series.</i></p> | | | |
| | <p><i>Conduct comprehensiveness reviews.</i></p> | <p><i>Confirm that estimates are presented for all source categories and for all years beginning with the base year appropriate for the current inventory period.</i></p> <p><i>Review that known data gaps resulting in incomplete emissions estimates for certain source categories are documented.</i></p> | | | |
| | <p><i>Compare estimates with previous estimates.</i></p> | <p><i>• For the Project, current inventory estimates should be compared with previous estimates. If there are significant changes or deviations from expected trends, re-examine</i></p> | | | |

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| | | <i>the estimates and explain any differences.</i> | | | |
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NOTE: This Project Document (PD) shall be completed following the instructions included. However, it is important to highlight that these instructions are complementary to the BCR STANDARD, and the Methodology applied by the project holder, in which more information on each section can be found.