

TEMPLATE

DEVIATION REQUEST FORM

PUBLICATION DATE **11.04.2021**

Version **5.0**

A. To be completed by Gold Standard

1 | Decision

1.1 | Date – 20 /04/2023

1.2 | Decision

The deviation request is approved.

The project developer can use the declaration signed by the recycler as evidence for the monitoring of parameter CSAC 41. The project developer shall ensure that the declaration is signed annually, and that the authenticity of the document is verified on a periodic basis.

The validating VVB shall, through appropriate means at its disposal, evaluate the project's compliance with the above-mentioned conditions and provides its opinion in the Validation Report.

SustainCert shall review both the project developer's submission and the VVB's opinion of the same and take appropriate steps.

1.3 | Is this decision applicable to other project activities under similar circumstances?

No

B. To be completed by the Project Developer/Coordinating and Managing Entity and/or VVB requesting deviation (Submit deviation request form in Microsoft Word format)

2 | Background information

Deviation Reference Number	DEV_393	
Date of decision	20/04/2023	
Precedent (YES/NO)	No	
Precedent details	NA	
Date of submission	18/04/2023	
Project/PoA/VPA	Project	ID – GS11623
	<input checked="" type="checkbox"/> PoA	ID – GS11623
	<input type="checkbox"/> VPA	ID – GSxxxxx
Project/PoA/VPA title	Permanent Sequestration of Biogenic CO ₂ in Demolition Concrete	
Date of listing	07/04/2022	
GS Standard version applicable	1	
Date of transition to GS4GG (if applicable)		
Date of transition to Gold Standard from another standard (e.g. CDM) (if applicable)		
Date of design certification/inclusion (if applicable)		
Location of project/PoA/VPA	Host country(ies)	
Scale of the project/PoA/VPA	<input checked="" type="checkbox"/> Microscale <input type="checkbox"/> Small scale <input type="checkbox"/> Large scale	
Gold Standard Impact Registry link of the project/PoA/VPA	https://registry.goldstandard.org/projects/details/3632	
Status of the project/PoA/VPA	<input type="checkbox"/> New <input checked="" type="checkbox"/> Listed <input type="checkbox"/> Certified design <input type="checkbox"/> Certified project	
Title/subject of deviation	End-use of recycled concrete	
Specify applicable rule/requirements/methodology	GS Methodology "Carbon Sequestration Through Accelerated Carbonation of Concrete Aggregate", V1.0, Section 5.2. (CSAC 41).	

gy, with exact paragraph reference and version number	
Specify the monitoring period for which the request is valid (if applicable)	Start date 07/04/2022 End date 06/04/2027
Submitted by	Contact person name: Lisa Braune
	Email ID: lisa.braune@neustark.com
	Organisation: Neustark AG
	Project participant: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Validation and Verification body (VVB opinion shall be included, where required by the applicable rules/requirements or request is submitted by the VVB).	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes; VVB name: Carbon Check VVB Staff name(s): Harish Sharma
Any previous deviations approved for the same project activity/PoA/VPA(s)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

3 | Deviation detail

3.1 | Description of the deviation:

**Guidance* Use the space below to describe the deviation and substantiate the reason for requesting deviation from applicable rules/requirements. Please include all relevant information in support of the request. You are requested to follow the principles for requesting deviations, given in the [Deviation Approval Procedure/ Design Change Requirements](#).*

3.1.1 | Deviation detail (to be completed by Project developer):

The Gold Standard Methodology “Carbon Sequestration Through Accelerated Carbonation of Concrete Aggregate”, V1.0, to which POA-DD GS11623 and respective VPA-DD refers, mentions in Section 4.1. (Project Boundary):

(4.1.1) “The spatial extent of the project boundary includes the physical, geographical site of concrete recycling facility, carbonation plant, source of CO₂ and the site where the end products, i.e., concrete aggregates and other are used at the end”.

It is further specified that “The end use of concrete aggregate shall be monitored on a qualitative basis through the parameter ‘End use distribution’ (CSAC 41), as prescribed in section 5.2.” of the same Methodology.

According to section 5.2., “the project developer shall assess the distribution of various end uses of concrete aggregate produced by the project/activity (i.e., use in road construction, concrete structures, residential and commercial landscaping etc.) and disclose it in the Monitoring Report”. End use distribution shall be monitored continuously by “sales invoices, sales records, or any other valid sources”.

With this deviation request we require that a declaration, which has to be signed by the concrete recyclers once per monitoring period, could serve as evidence for the monitoring of parameter CSAC 41. With the signature of the declaration the concrete recycler confirms that the concrete aggregate is only used for construction products (e.g., road construction or recycling concrete) or landfilled and that it is not going into a municipal solid waste incineration process nor a clinker oven after the carbonation process. This declaration should also be a valid evidence of the monitoring parameter CSAC 41 for any other host country considered in the PoA-DD.

3.1.2 | VVB opinion (to be completed by VVB, if applicable):

**Guidance* If required by SustainCERT or Gold Standard for this particular deviation, please add here the VVB’s opinion.*

NA

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3.2 | Assessment of the deviation:

**Guidance* Use the space below to describe how the deviation complies with the requirements, and, where applicable, the accuracy, completeness and conservativeness is ensured. Please include all relevant information in support of the request.*

3.2.1 | Deviation assessment (to be completed by Project developer):

The requested deviation to the monitoring plan regarding the 'End use distribution' of the carbonated recycled concrete is applicable to the PoA, all included VPAs, and Monitoring Reports submitted, starting from the acceptance date of this request and with a permanent duration.

The required deviation complies with the principles and requirements validated for the PoA and VPAs. Importantly, parameter CSAC 41 should ensure that the end use of concrete aggregate does not lead to any re-emission of the CO₂ sequestered. Re-emission of CO₂ happens only if the carbonated recycled concrete is heated up above 900°C and CaCO₃ starts decomposing. Qualitatively monitoring of the end use distribution of the carbonated concrete aggregate thus allows to confirm that the recycled concrete aggregate is not used in such conditions, notably in the production of clinker. However, today there are three use cases for concrete aggregate: (1) production of recycling concrete, (2) in road construction, e.g., as filler material, or (3) landfilling.

The report¹ published by the Swiss Federal Office of Material Science and Technology (EMPA) shows the recycling rate and recycling uses of various construction materials in Switzerland. According to pages 38-39 of this report (Figure 1), 85% of concrete is recycled, 15% is landfilled, and 0% is incinerated (i.e., KVA).

¹ Material- und Energieressourcen sowie Umweltauswirkungen der baulichen Infrastruktur der Schweiz (v6, 2016). Swiss Federal Office of Environment (FOEN) and Swiss Federal Office of Material Science and Technology (EMPA). Accessible under https://www.empa.ch/documents/56122/728861/MatCH_Bericht_Bau_v8_161017.pdf/3a733b91-ab69-43cd-ad81-2b6817716eff

	Transferkoeffizienten für Aufteilung in Verwertung/Entsorgung nach Direktverwertung			Total
	Recycling	KVA	Deponie	
Kies, Sand / Strassenaufbruch	0.82	0.00	0.18	1.00
Asphalt / Ausbaupasphalt	0.83	0.00	0.17	1.00
Beton / Betonabbruch	0.85	0.00	0.15	1.00
Mauerwerk / Mischabbruch	0.80	0.00	0.20	1.00
Brennbare Materialien	0.28	0.64	0.08	1.00
Holz	0.10	0.87	0.03	1.00
Metalle	0.98	0.00	0.02	1.00
Keramik, etc. / Min. Fraktion	0.03	0.00	0.97	1.00

Figure 1. Fraction of waste materials recycled (Recycling), incinerated together with municipal solid waste (KVA) and landfilled (Deponie) ¹. The fractions corresponding to waste concrete are highlighted in yellow.

Moreover, of the total recycled concrete, 77% is used as aggregate in recycled concrete for building construction and 23% is used for road construction (Figure 2).

This data shows that there are no current use cases in Switzerland which lead to re-emission of the sequestered CO₂. Therefore, providing a signed declaration by the concrete recycler involved in the project for each Monitoring Period is thus considered appropriate and satisfactory for the parameter 'End use distribution'.

A similar monitoring plan of 'End use distribution' proposed here for Switzerland is suggested also to the PoA and VPAs located in any other host countries.

Fluss Recycling* %-Verteilung pro Materialkategorie										
	Prozentuale Verteilung pro Materialkategorie [%]									Total
	Hochbau						Tiefbau			
	EFH	MFH	DLG	IND	LWG	UEB	Strasse	Schiene	Ent-Vers	
Kies, Sand / Strassenaufbruch	0%	0%	0%	0%	0%	0%	68%	8%	25%	100%
Asphalt / Ausbaupasphalt	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%
Beton / Betonabbruch	15%	31%	10%	10%	3%	8%	4%	0%	19%	100%
Mauerwerk / Mischabbruch	20%	47%	8%	5%	7%	8%	0%	2%	3%	100%
Brennbare Materialien	20%	34%	16%	13%	4%	9%	0%	0%	5%	100%
Holz	20%	32%	8%	8%	15%	5%	0%	2%	11%	100%
Metalle	11%	19%	13%	18%	5%	8%	2%	6%	18%	100%
Keramik, etc. / Min. Fraktion	18%	45%	11%	8%	6%	7%	0%	0%	5%	100%

= Sekundärzufluss (aus Recycling)

Figure 2. Use cases of waste recycled materials¹ for the construction of buildings (Hochbau) or underground engineering (Tiefbau). The percentages corresponding to demolition concrete are highlighted in yellow.

3.2.2 | VVB opinion (to be completed by VVB, if applicable):

**Guidance* If required by SustainCERT or Gold Standard for this particular deviation, please add here the VVB's opinion.*

NA

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3.3 | Impact of the deviation:

**Guidance* Use the space below to describe the impact of the deviation on project design, safeguarding principles assessment, SDG assessment, emissions reductions, monitoring frequency, data quality, potential risk or any other relevant aspect of the project. Please substantiate the impact assessment with relevant and verifiable data/information.*

3.3.1 | Impact assessment (to be completed by Project developer):

The requested deviation on the PoA and VPA level does not impact previous requirements, safeguarding principles and assessment of emissions reductions considered previously. It provides a simple and effective process to assess the end use distribution of carbonated concrete aggregate.

3.3.2 | VVB opinion (to be completed by VVB, if applicable):

**Guidance* If required by SustainCERT or Gold Standard for this particular deviation, please add here the VVB's opinion.*

"VVB has assessed the deviation request by the project developer to provide the alternate evidence to establish 'End use distribution' (CSAC 41), prescribed in section 5.2 of the GS methodology "Carbon Sequestration Through Accelerated Carbonation of Concrete Aggregate V1.0".

VVB would like to assert that the recycled aggregates made from demolition concrete can be used for a variety of purposes, both in construction and other applications. Some of the most common end uses of recycled concrete aggregates include:

Sub-base material: Recycled concrete aggregates can be used as a sub-base material in road and pavement construction, providing a stable and durable foundation for the road surface.

Base course material: Recycled concrete aggregates can also be used as a base course material in road and pavement construction, providing additional strength and stability to the road surface.

Concrete production: Recycled concrete aggregates can be used as a replacement for natural aggregates in the production of new concrete, reducing the need for virgin materials and lowering the environmental impact of concrete production.

Landscaping: Recycled concrete aggregates can be used as a decorative landscaping material, such as in the construction of retaining walls, garden paths, and drainage systems.

Erosion control: Recycled concrete aggregates can also be used in erosion control applications, such as in the construction of riprap for shorelines and riverbanks.

Overall, the use of recycled concrete aggregates can help reduce the environmental impact of construction activities, conserve natural resources, and provide economic benefits by reducing the need for virgin materials.

The use of aggregate made from demolition concrete in the calcination process is not a suitable option, but it depends on various factors such as the quality and composition of the demolition concrete, the specific calcination process, and the desired outcome of the process. Calcination is a high-temperature process that involves heating a substance to a specific temperature to drive off volatile compounds and produce a more stable compound. Demolition concrete can contain impurities such as contaminants and metals that may affect the calcination process at high temperatures by emitting toxic gases or unfavorable compounds, which could affect the final product quality. Therefore, it is not considered suitable for use in the calcination process.

Furthermore, VVB has assessed the report submitted by the project developer. The report, namely "Material, Energy resources and environmental impact on the structural infrastructure of Switzerland," has been published by Materials Science & Technology - Department of Technology and Society (EMPA) on behalf of Federal Office of the Environment Department of Waste and Raw Materials. The report presented the transfer coefficient of allocation of concrete/concrete demolition for recycling/disposal after direct recycling. The report established that 85% of concrete/concrete demolition is recycled, 15% of it is used in landfills, and 0% is used for incineration processes, i.e., it is not a common practice in Switzerland to incinerate concrete/demolition concrete.

As per the methodological requirement, the project developer shall assess the distribution of various end uses of concrete aggregate produced by the project/activity (i.e., use in road construction, concrete structures, residential and commercial landscaping, etc.) and disclose it in the Monitoring Report. The source of data mentioned in the methodology is sales invoices, sales records, or any other valid sources. VVB has assessed that sales records like invoices generally don't mention the use of the product. Hence, on a qualitative basis, it is difficult to establish the end use of the aggregate by analyzing the names of end-users mentioned in the invoices. "Furthermore, as described earlier, the use of aggregate made from demolished concrete in the calcination process is not a suitable option due to various factors. This is further established by the report submitted by the project developer, which indicates that incineration of concrete and demolition concrete is not a common practice in Switzerland. Hence, considering all the facts, VVB opines that the declaration by the concrete recycler may be accepted if, for a given monitoring period, the project developer is able to demonstrate the material balance of the process by providing quantitative data for input material, final output material, sales, and inventory.

3.4 | Documents:

**Guidance* List of documents provided (note that once a decision has been made by Gold Standard, this deviation form along with supporting documents will be made public on the Gold Standard website. If any of the supporting documents are confidential, please indicate here to ensure they are omitted.)*

n/a

Version number	Release date	Description
5	11.04.2022	Additional information added: <ul style="list-style-type: none"> - date of listing, design certification, transition - standard version - specific reference to a requirement deviated from - any previous deviations/design changes approved Guidance on VVB opinion
4	14.01.2021	
3	16.07.2020	
2	03.05.2018	
1	01.07.2017	Initial adoption