General information

Remover name	Greensand		
Project code	GSDR005		
Project name	Uithoornlijn Greensand		
Location	Tramlijn 25 van Amsterdam-Zuid naar Uithoorn		
Area	7.38	km	
Year	2023		
Duration	>10.000	years	estimated permanence of removal and storage
Material dosage	992	ton	
Holding buffer	20%		freed up when measurements confirm projection pathways
Project emissions	0.068	tCO2eq/ton	LCA estimate
Reference material emissions	0.067	tCO2eq/ton	

Per project

Projected storage	266	tCO2	storage potential per ha x area x storage duration 100 year equivalent
LCA emissions	1	tCO2	project related emissions compared to reference material
Net storage potential	265	tCO2	project storage -/- emissions over 20 years

Removal credits issued

Holding buffer	53	credits	
Credits issued	212	credits	

Material description				
Material type	Olivine			
Material name	Halfverharder GreenSand, fraction 0-6 mm, Olivine			
Material dossage	992	ton		
Material origin	Spain			
Properties				
Magnesium percentage	39%			
Grain size distribution	< 16	mm	100%	
	< 8	mm	96,73%	
	<4	mm	64,7%	
	< 2	mm	39,12%	
	< 1	mm	22,75%	
	< 0,5	mm	12,81%	
	< 0,25	mm	8,6%	
	< 0,063	mm	3,95%	

Carbon Calculation for	**GSDR005**							
The following values are calculated with the Vink&Knops model (Vink & Knops, 2023; see https://doi.org/10.3390/min13020235)								
Duration	Erosion rate	Olivine dissolved (|cumulative)		CO2 sequestered		Weathering	Olivine Dissolved (/yr)	
(year)	(um)	(kg)	(%)	(kg)	(ton)	(um/yr)	(kg/yr)	
30	25.72	162,073	16.3%	138,086	138	0.86	3,161	
100	85.72	312,154	31.50%	265,955	266	0.86	1,993	
Referentie scenario								

Sources											
Location dependant value											
	DOC	**60.000**	Dissolved Organic Carbon				Assumption Diss	https://doi.org/10.3390/min13020235			
	pH value	**5.50**					pH of rainwater	https://www.knmi.nl/kennis-en-datacentrum/uitleg/zure-regen			
	Rate	**1.00**	kg CO2/kg Olivine				Afh. Olivijn samenstelling (100% Forsteriet)				
	Olivine	**100%**	off total feedstock				Hoeveelheid olivijn aan mengsel (m/m)				
	Dosage	16,000	ton								
	Magnesium percentage	39%									

Life Cycle Assessment									
Source	https://cdn.shopify.com/s/files/1/0549/3696/1137/files/39658-halfverharder-greensand--fractie-0-6-mm--olivijn-202308281018-short_1.pdf?v=1695291373								
Declared unit	1	ton							
	A1	**A2**	**A3**	**A4**	**A5**				
GWP (kg CO2eq)	6.22E+00	4.57E+01	2.56E-01	1.19E+01	4.03E+00				
Total GWP	68.11	kgCO2eq / t material							
Total GWP	0.0681	tCO2eq/ton							
Life Cycle Assessment reference material									
Emissions (tCO2 / kg olivine)	0.0666								
CO2 mining (kg CO2)	2.8								
CO2 milling (kg CO2)	0.7								
CO2 transportation (kg CO2)	63.1	Quenast to Uithoorn (205 km)		205	63.10542169	51.1			
				166	0.3078313253				