UWR Rainwater Offset Unit Standard

(UWR RoU Standard)

Concept & Design: Universal Water Registry

www.uwaterregistry.io

Project Concept Note & Monitoring Report

(PCNMR)

Project Name : New Rain Resort Rainwater Harvesting Project

UWR RoU Scope: RoU Scope 2

Monitoring Period: 15/05/2020-15/05/2025

Crediting Period: 2020-2025

UNDP Human Development Indicator: 0.601 (Kenya)

A.1 Location of Project Activity

State	Kiambu
District	Kiambu
Lat. & Longitude	-1.08725,36.9777305(1°5’14.10”S,36°58’39.83”E)
Area Extent	Groundwater surface
No. of Villages/Towns	1

***Provide maps where applicable**

A.2. Project owner information, key roles and responsibilities

Project Proponent Details

- Name – New Rain Limited (New Rain Resort)
- Director – Mrs.Esther Kibere
- Address – The New Rain, Kenyatta Road, Kiambu County, P.O. BOX 64683-00620 Nairobi
- Project proponent email – info@newrain.co.ke/ ekibere@yahoo.com

Aggregator Details

- Name – Pass Africa Ltd.
- Director – Mr.Ajay Shah
- Address – Sunrise Avenue, Gatongora Village, Ruiru East, P.O. Box 38937-00623 Nairobi
- Aggregator email – ajay@passafricadrilling.co.ke/ ajayshah.pal@gmail.com

This project was implemented and is being registered by Pass Africa Ltd. under authorization by New Rain Limited (see Communication Agreement in Appendix).

New Rain Limited, project proponent (PP) is committed to the construction and maintenance of the earth dam and connected drainage systems. The proponent ensures the successful operation and maintenance of the earth dam, which is designed to capture and store rainwater runoff from a 3km long stormwater drain on the access road to the project site. The stored water is used for herb farm an greenhouse irrigation, and for the supply of water to the resort. The proponent is responsible for

maintaining the catchment area and ensures the smooth flow of rainwater to the earth dam. They also ensure the prevention of wastage and the efficient use of the harvested water.

A.2.1 Project RoU Scope

PROJECT NAME:	New Rain Resort Rainwater Harvesting – Kiambu, Kenya
UWR Scope:	RoU Scope 2: Measures for conservation and storage of excess surface water for future requirement
Date PCNMR Prepared	30/07/2025
Catchment Area	3km stretch of Kenyatta Road (see diagram)
Construction type	Concrete
Average rainfall	Short rain season – 421-490mm Long rain season – 491-560mm
Runoff coefficient	0.85
Evaporation and absorption losses	20%
Catchment capacity	30,000m^3
RoU crediting period	2020-2024
Total RoUs generated for the crediting period	136,372

A.3. Land use and Drainage Pattern

Kiambu County is located in the central region and covers a total area of 2,538.7 Km2 according to the 2019 Kenya Population and Housing Census. It also borders six counties namely Nairobi and Kajiado Counties to the South; Machakos to the East; Murang'a to the North and North East, Nyandarua to the North West, and Nakuru to the West. Further the County lies between latitudes 00 25'and 10 20'South of the Equator and Longitude 360 31'and 370 15'East. The region is known for agricultural activities

due to the favourable climatic conditions and the fertile soils. A large proportion of the population in the County depend on agriculture thus making it to be the predominant economic activity. Agriculture therefore contributes the largest share of County population's income and overall Gross Domestic Product in Kenya. Other activities that take place in the urban areas of the County include industrial/ manufacturing activities. The County further has quarrying and mining activities taking place such as in Juja and Thika Sub Counties.

A.4. Climate

The county experiences two rain seasons: the long rains season runs between March and May and is wetter than the short rains season experienced between October and December. Dry spells (periods with less than 20 mm rainfall) occur between July and September. This season is also cooler characterised with drizzles and frost in some parts of the County. April receives the highest rainfall, more than 200 mm. The annual average precipitation in the county is 600-1300 mm. The northern region receives an annual average precipitation of more than 1000 mm. Historical annual average rainfall and temperature records show a directional-spatial trend, with peak values generally appearing in the northern parts of the county for precipitation and western parts of the county for temperatures.

The annual average temperature for the county is 15-23°C. The western areas of the county including the upper midland and the lower highland agro ecological zones experience annual average temperatures greater than 20°C. Lowest temperatures are recorded in the months of June to August whereas highest temperatures are recorded in the months of January to March. The county's average relative humidity ranges from 65 percent in February which is generally a hot month and 84 percent in the wet months of April and May.

A.5. Rainfall

Year	Annual Average
2020	1000mm
2021	1100mm
2022	1000mm
2023	1500mm
2024	1282mm

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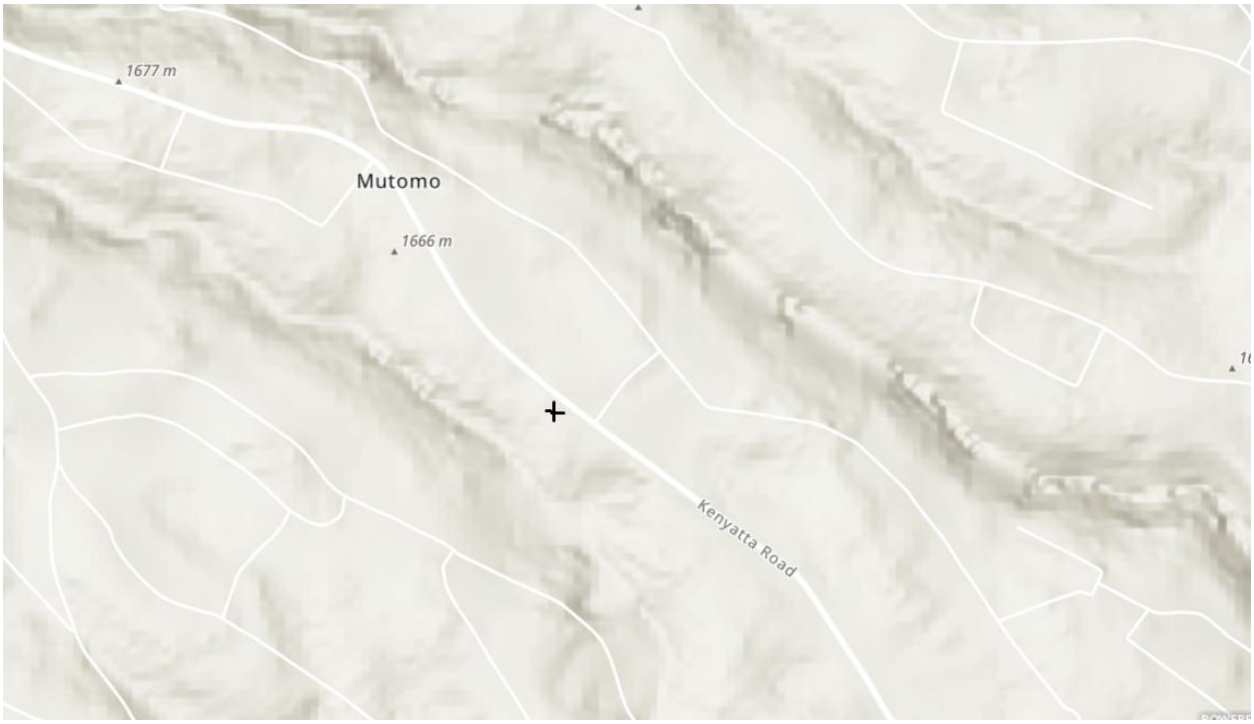
A.6. Ground Water

The project area sits on an igneous volcanic geology with intrusive igneous aquifer with moderate productivity. The consolidated sedimentary intergranular/fractured nature of the aquifer indicates that the flow of water is slow through the interconnected pores of and higher through the fractures. Groundwater in the project location is potable and there are no special issues to note.

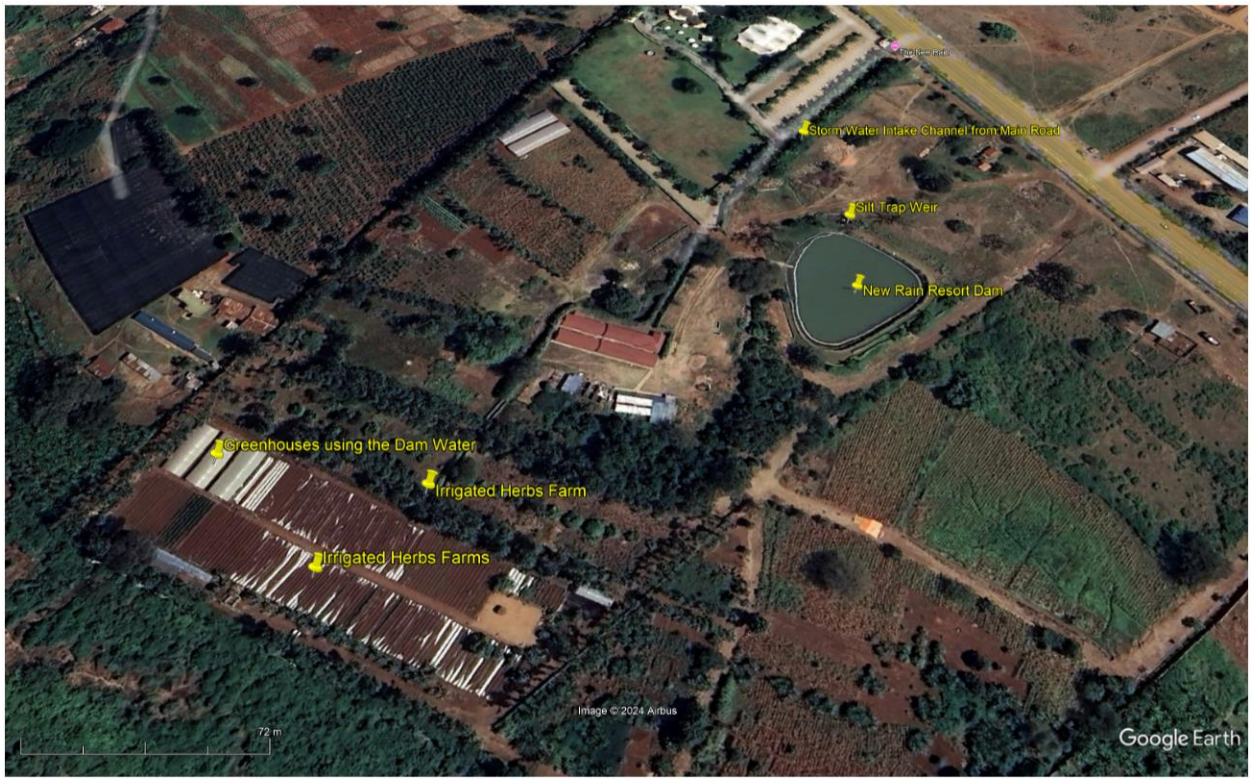
A.7. Alternate methods

The topography of the location as shown below (marked by X) indicates its positioning on low-lying land. Additionally, groundwater in the Nairobi/Kiambu aquifer is highly over-extracted with an extraction rate 30% higher than the recharge rate. Therefore, the project proponent decided to leverage their topographical advantage to harvest and store rainwater as their primary source of water. This activity enabled the project proponent to avoid extracting water from the already over-extracted localized aquifer.



A.8. Design Specifications

The catchment structure is a 30,000 cubic meter triangular earth dam. The design include a core trench, embankment, silt trap and sump, 1200mm diameter underground culvert spillway and environmental protections such as planting of grass on the embankment and stone pitching for the tail-end of the race end of the spillway.



A.9. Implementation Benefits to Water Security

A single structure has been implemented to meet the demand of the facility. The specifications of the structure and the facility served by the structure are as follows:

Facility Details

Plot area: 23 acres

Estimated yearly demand: 28,800 m^3

Built-up area: 10 acres

Catchment structure capacity: 30,000 m^3

Please see images in previous section (A.8)

A9.1 Objectives vs Outcomes

Objective: The major objective was to make The New Rain Resort and its farms self-sustaining by leveraging rainwater harvesting and without putting additional load on the localized underground aquifers.

Outcome: A 30,000 cubic meter triangular earth dam and piping from roadside stormwater drains have been built to harvest rainwater run-off from a 1.4km patch of tarmac road. The harvested water has enabled the project proponent to reduce their dependency on groundwater and council water for the operations of the resort and its farms; this in turn has reduced the aggregate cost of water to the project proponent.

A9.2 Interventions by Project Owner / Proponent / Seller

The project implementation was fully funded by the project proponent. Additionally, the project proponent has also deputed dedicated maintenance staff to ensure the continued operation of the rainwater harvesting system (piping and culverts from roadside stormwater drain, and earth dam) and protection of the harvesting area. The project proponent also continuously monitors the fresh-water life such as fish & amphibians and conducts regular lab-tests to ensure the water quality. The on-site farm managers have been trained on sustainable farming practices and demand management.

A.10. Feasibility Evaluation

The implementation of the earth dam would provide an alternative source of water for the resort and agricultural activities undertaken at the New Rain Resort.

Demand analysis

Item	Value	Unit	Formula
Agriculture demand	60	cubic m/Ha	
Farm area	2.5	Ha	
Days of irrigation	180	days	
Agricultural demand	27000	cubic m	Days of irrigation * farm area * per Ha demand
Daily resort demand	5	cubic m/ day	
Days of demand	360	days	
Yearly resort demand	1800	cubic m	Days of demand x daily demand
Total Yearly demand	28800	cubic m	Agricultural demand + resort demand

Pre-project supply analysis

Source	Ratio	Quantity (cubic m)	Formula
Borehole	80%	23040	Total demand x ratio
City council water	20%	5760	Total demand x ratio

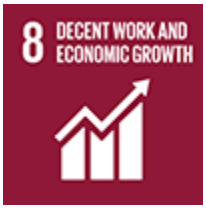
Pre-project water supply cost analysis

Item	Value	Unit	Formula
City council rate	362	ksh/ cubic m	
Borehole rate	5	ksh/ cubic m	
City council expense	Ksh2,085,120.00	Ksh	City council demand x rate
Borehole expense	Ksh115,200.00	Ksh	Borehole demand x rate
Total Yearly expense	Ksh2,200,320.00	Ksh	

The total capital expenditure for the project was Ksh 5,800,000. Given the fact that the project proponent is now solely using the earth dam for its water supply, they are saving the funds previously being used towards the yearly water supply expenditure (Ksh 2,200,320). The savings would pay back the CAPEX of the project within 2.5 years. Additionally, the continued savings after the payback period made the project economically feasible for the project proponent.

A.11. Ecological Aspects & Sustainable Development Goals (SDGs):

SDG Goal Targeted	Most relevant SDG Target/Impact	SDG Indicator
6. Clean Water and Sanitation	6.4 By 2030, substantially	6.4.1 Change in water-use

	increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity	efficiency over time 6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources
8. Decent work and economic growth 	8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services	8.3.1 Proportion of informal employment in total employment, by sector and sex

The ecological issues being addressed by this project are as follows:

1. Overextraction of localized aquifer – The current extraction rate across the Nairobi aquifer is 30% higher than the recharge rate. Therefore, in addition to managed aquifer recharge, reducing extraction by large commercial extractors such as factories, hotels and farms is also necessary. The implementation of this project has enabled the project proponent to reduce their dependency on ground water extraction.

A.12. Recharge Aspects :

The constructed earth dam is lined with PVC liner, therefore there is no percolation of water from the reservoir into underground aquifer systems.

A.13. Quantification Tools

The earth dam has been fitted with a level meter for use in quantification of the amount of rainwater harvested and stored.

Water Harvesting Potential

Water harvesting potential of any catchment area is to be calculated under this methodology for each given year that the RoU is being claimed. The total amount of water that is received from rainfall over an area is called the rainwater legacy of that area. The amount that can be effectively harvested is called the water harvesting potential.

The formula for calculation for harvesting potential or volume of water received or runoff produced or harvesting capacity is given as:-

Harvesting potential or Volume of water utilized (liters) =	**Area of Catchment/Roof/Collection Zone (m^2) X Amount of rainfall (mm) X Runoff coefficient**

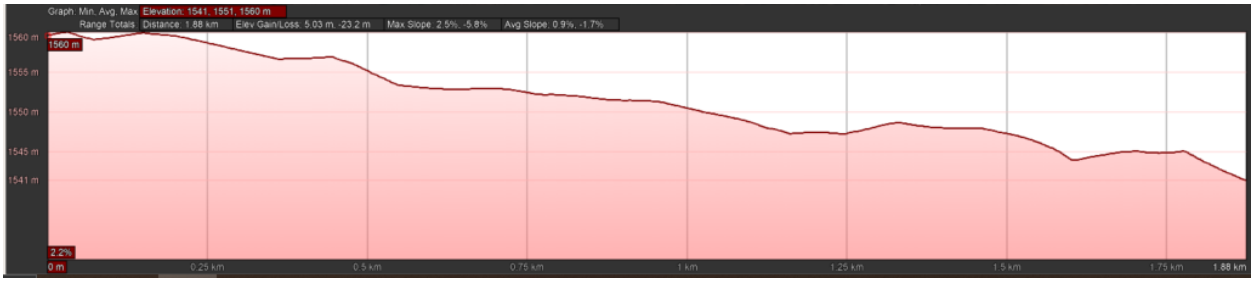
Analysis of Catchment Area

The catchment area for this project is a patch of tarmac road leading up to the property. The start and end point of the road are as follows:

1. Start point 1 - 1° 4'22.60"S, 36°58'6.44"E
2. Entry point of storm drain to property - 1° 5'8.29"S, 36°58'41.37"E
3. Start Point 2 - 1° 5'19.68"S, 36°58'47.96"E

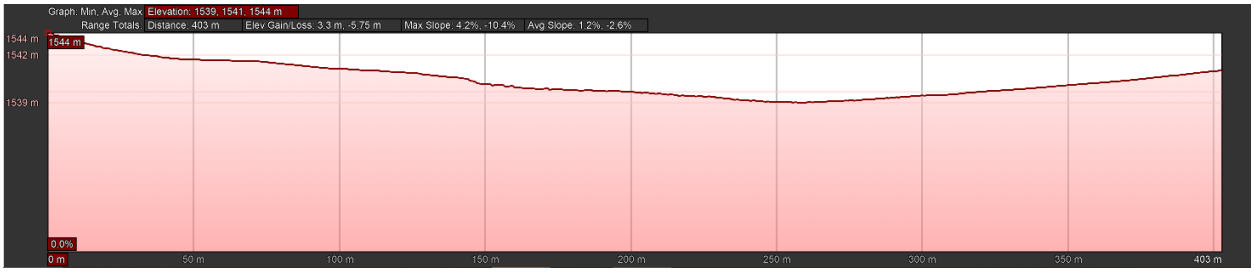
The elevation profiles from the two starting points to the entry point of the storm drain into the property are as follows:

Point 1 to Entry



- Starting elevation – 1560m
- Ending elevation – 1542m
- Distance between start and end – 1.87km

Point 2 to Entry



- Starting elevation – 1544m
- Ending elevation – 1541m
- Distance between start and end – 403m

The change elevation between the two starting points and the entry point to the property proves the flow of rainwater towards the property through the stromdrains along the sides of the road. As the width of the road is 15m the total catchment area is calculated as follows:

(Distance between start point 1 and entry point + Distance between start point 2 and entry point) X 15m

(1870m + 403m) x 15m = 34,095m^2

Runoff coefficient

Runoff coefficient for any catchment is the ratio of the volume of water that runs off a surface to the volume of rainfall that falls on the surface. Runoff coefficient accounts for losses due to spillage, leakage, infiltration, catchment surface wetting and evaporation, which will all contribute to reducing the amount of runoff. Runoff coefficient varies from 0.5 to 1.0. Given that the catchment area is an asphalt road with a concrete storm drain the runoff coefficient chosen is **0.85**

Type of Area	Recommended Runoff Coefficient (K)
Residential	0.3 to 0.5
Forest	0.5 to 0.2
Commercial & Industrial	0.9
Parks and Farms	0.05- 0.3
Asphalt or Concrete Paving	0.85
Road surface	0.8-0.9

Annual Rainwater harvesting Potential

Annual rainwater harvesting potential is given by $V = K \times I \times A$

Where, V=Volume of water that can be harvested annually in liters.

K = Runoff coefficient

I = Annual rainfall in (mm)

A = Catchment area in (m^2)

Quantification

Crediting period	Rainfall (mm)	Rainwater harvesting potential (m3)	Evaporation & uncertainty adjustment (-20%)	RoUs (1 RoU = 1000L)/yr
15/05/2020-14/05/2020	1000	28980750	23184600	23185
15/05/2021-14/05/2022	1100	31878825	25503060	25503
15/05/2022-14/05/2023	1000	28980750	23184600	23185
15/05/2023-15/05/2024	1500	43471125	34776900	34777
15/05/2024-15/05/2025	1282	37153322	29722657	29723

A.14. UWR Rainwater Offset Do No Net Harm Principles

This project has increased the sustainable yield of the project proponent's property without putting additional load on the already over-extracted localized aquifer. This has been done by channeling unutilized rainwater from the stormwater drains along the road outside the property to an earth dam constructed within the proponent's property. The earth dam acts as a facility to store the unutilized rainwater runoff from the road for future use. Additionally, the sustainable and dependable access to water has improved the efficiency of the farms on the property, which in turn has provided safe employment and training opportunities for a number of women.

A.15. Scaling Projects-Lessons Learned-Restarting Projects

Please describe how the project can be scaled further and take into account existing integrated practices, as well as areas of duplication that might contribute to better water and urban management.

All the rainwater runoff from the roads and pavements in Kenya is directed into rivers that eventually flow into lakes or into the ocean. Additionally, the rapid urbanization of Nairobi city and its surrounding areas has lead to a drastic increase in rainwater runoff. Therefore, existing storm water drain, canals and rivers are unable to effectively channel rainwater runoff, leading to urban flooding and damages to property. We believe projects such as the one implemented at the New Rain can serve a solution to multiple challenges as follows:

Challenge	**Solution**
Unutilized rainwater runoff	Channeling stormwater drains into earth dams and other storage facilities for future use
Urban flooding due to excessive rainwater runoff	Channeling rainwater runoff into earth dams would reduce the load on existing canals and rivers, reducing the risk of overflow and flooding
Depleting aquifer	Earth dams supplied with rainwater runoff would provide people with an alternative source of water, reducing the load on underground aquifers.

	This in turn would combat the continued depletion of the aquifers and allow time for natural recharge to catch-up.

Due to the above rationale we believe this project hold great potential for scalability across Nairobi city and its surrounding areas.

APPENDIX

Communication Agreement

UNIVERSAL CARBON REGISTRY

RoU Communications Agreement
Universal Carbon Registry

RoU Communications Agreement
25th November 2024

This Communications Agreement ("Agreement") is made as of November 25th, 2024 ("Effective Date") by and between:

New Rain Limited Kenyatta Road Kimabu County – P O Box: 64683-00620 Nairobi ("Project Proponent"); and

Pass Africa Ltd- Ajay Shah: PO Box: 38937-00623 Nairobi_("Authorised Representative"), a company incorporated under the laws of Kenya having its registered office at Sunrise Avenue, Gatongora Village Ruiru East-[registered address]

WHEREAS, the Project Proponent is the owner of the New Rain Hotels and the water body ("**Project")** and has legal and beneficial title to all the emission reductions generated by the Project; and

WHEREAS, the Project Proponent wishes to contract with the Authorised Representative to act on its behalf in respect of certain rights, actions and activities in the Universal Carbon Registry ("**Registry**"):

NOW, THEREFORE, in consideration of the promises and mutual obligations and covenants contained herein, the sufficiency of which is hereby acknowledged, and intending to be legally bound, the parties agree as follows:

Definitions

Capitalised terms shall have the meanings given below:
"Authorised Representative" ***means the entity or individual authorised by a Project Proponent to communicate with and provide instructions to the registry administrator on its behalf, such authorisation granted through this communications agreement, which shall be submitted to the registry administrator and on which the registry administrator shall be entitled to rely.***
"Project Proponent' ***means the*** individual or organisation that has overall control and responsibility for the project, ***in accordance with UCR RoU Program requirements. This includes providing a project description, monitoring report and proof of title for validation and/or verification.***

1. Grant of authority. The purpose of this Agreement is to provide the requisite grant of authority to the Authorised Representative, and the means by which the Project Proponent(s) authorises the Authorised Representative, to communicate with and to provide instructions to the registry administrator on its behalf, the form and scope of which instructions shall be determined solely by the registry and the parties hereto.

- ***2***. Authorised Actions. Authorised Representative is authorised to act for the Project Proponent with respect to the following rights, actions and/or activities in the Registry ("Authorised Actions"):
  - to request registration of the Project;
  - to request the issuance of voluntary water offsets("RoUs", as such term is defined by the UCR RoU Standard) from the Project by the Registry (**"RainWater Offset Units or Watercredits"**);
  - to request the transfer of RoUs or Water Credits from or to the Authorised Representative's account in the Registry;
  - to retire/transfer/convert RoUs or Water Credits on behalf of itself, the Authorised Representative or any third party as determined by the Authorised Representative from time to time;
  - to communicate to and to provide instructions to the Registry in relation to the Project and/or Water Credits; and
  - to take all other reasonable actions required by the Registry in order to perform the actions listed in paragraphs a) through e) above.

- ***3.*** Withdrawal from project. When any Project Proponent withdraws from the Project or assigns its rights to a third party, such Project Proponent shall sign any amendments to the communications agreement before the project registration process can proceed.
- 4. Multiple project proponents. When there are multiple Project Proponents on the project description that has been fully and properly verified, a duly executed counterpart of this Agreement shall be provided to the registry administrator, which counterpart shall (i) bear the signatures of all Project Proponents and (ii) set out which project proponent shall be stated as such on the project record on the registry and project database, and (iii) set out into which account any RoUs shall be issued.

5. ***Sole agent. In respect of the Project and the Water Credits, the Authorised Representative is authorised to communicate with and to transact with the Registry as the Project Proponent's sole and exclusive agent.***

6. Limited authorisation. The Authorised Actions are the only actions which the Authorised Representative is authorised to undertake on behalf of the Project Proponent under the Registry rules, and the Project Proponent retains all its rights and responsibilities under the Registry rules.

7. Confidential Information. In the course of exercising the authority granted to it hereunder, ***the Authorised Representative shall be entitled to access certain Confidential Information of the Project Proponent. Use of such Confidential Information by the Authorised Representative is permitted by the Project Proponent for the sole purposes of creating, issuing, transferring and retiring Water Credits, registering the Project, providing data to the Registry, reviewing reports created for the Project Proponent in the Registry and the payment of fees (if applicable to the Authorised Actions). Any further use of the Confidential Information without the Project Proponent's prior written consent is prohibited.***

8. Compliance with Registry rules. Notwithstanding the foregoing provisions of this Agreement, the Project Proponent shall remain responsible and liable for compliance with all Registry rules relating to actions taken by the Authorised Representative on its behalf.

9. Reliance by Registry. The parties intend and agree that the Registry shall be entitled to rely on this Agreement as and when delivered to it, and until terminated as provided below, and hereby request and direct the Registry to act on the basis of the authority granted herein to the Authorised Agent, and each party hereby relieves it of all liability for so doing.

10. Term and termination. This Agreement shall be and remain valid and subsisting beginning on the Effective Date until terminated by the Project Proponent by written notice of termination by such Proponent to both the Registry and to the Authorised Representative.

11. Headings. Section headings are for ease of reference only and do not form part of the Agreement.

Each party represents that the person signing this Agreement on its behalf is authorised to cause the party for whom he or she signs to enter into this Agreement.

IN WITNESS WHEREOF, the parties hereto have entered into this Agreement as of the Effective Date.

SIGNED for and on behalf of [NEWRAIN LIMITED] (Project Proponent):

NEWRAIN LIMITED
P. O. Box 64683 - 00620
MOBIL PLAZA
NAIROBI

By: _____

SIGNED for and on behalf of [New Rain] (Project Proponent):

By: _____

Name: Esther Kibere

Title: Director

Date of execution: 10/01/2025

SIGNED for and on behalf of [Pass Africa Ltd – Ajay S Shah] (Authorised Representative):