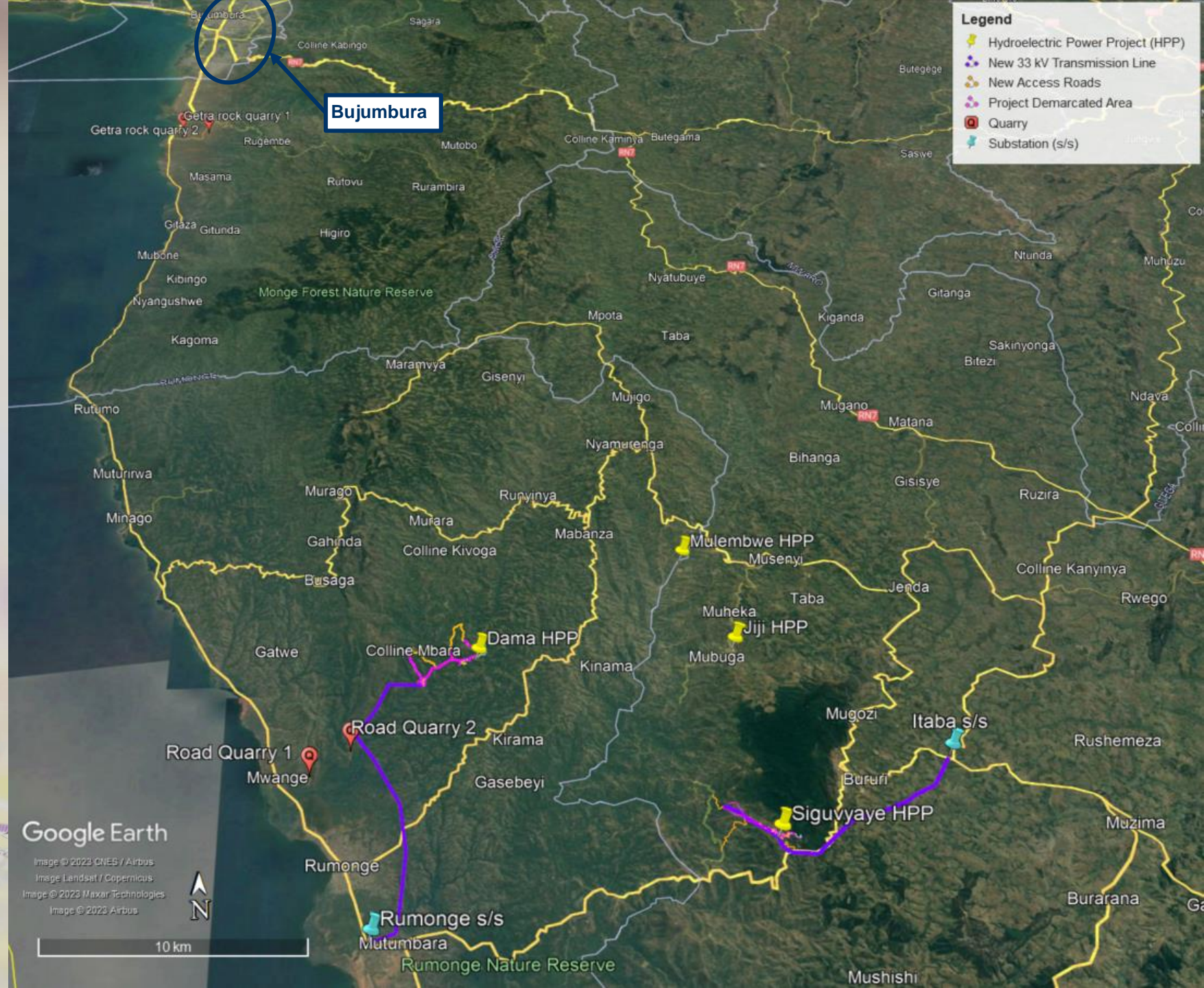
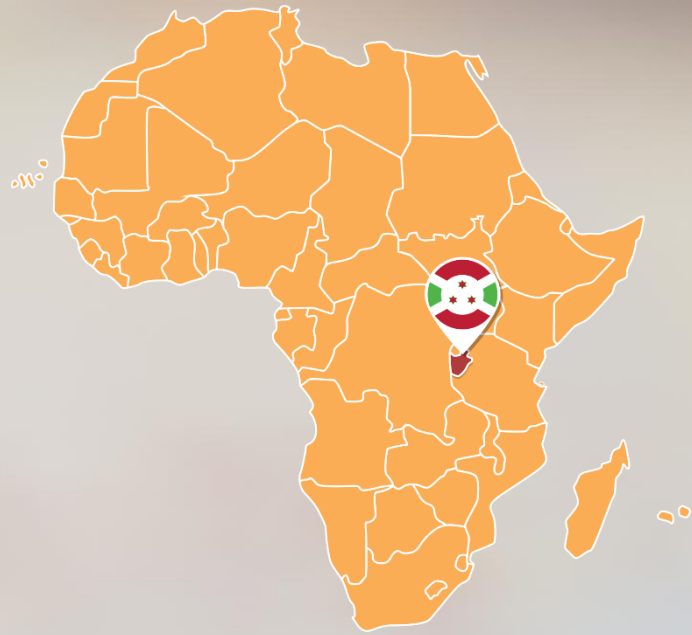




HYDROPOWER DEVELOPMENT IN BURUNDI



❖ DAMA HPP
 Flow - 6.8 m³/s
 Net Head - 167 m
 Total Investment Cost - USD 41.1 mln



Medium 15m high mass concrete gravity dam (Ogee crest)



Desander



Desander - Forebay



Small 3m high concrete horseshoe weir (Ogee crest)

Canal 1.1 km

Canal 0.5 km



Forebay

Penstock 2.4 km

Penstock 3.2 km



Surge Tank

Surge Tank



Power Station

2 x Horizontal Francis

Plant Installed Capacity - 9.8 MW

Annual Energy (P50) - 47.9 GWh



Power Station

2 x Vertical Pelton

Plant Installed Capacity - 12.4 MW

Annual Energy (P50) - 66.2 GWh

❖ SIGU HPP
 Flow - 4.6 m³/s
 Net Head - 320 m
 Total Investment Cost - USD 43.8 mln



Electricity Access (~50 MW Installed Capacity)

- ❖ Utility - Régie de Production et de Distribution d'Eau et d'Electricité (REGIDESO) of Burundi is the Water and Electricity Production and Distribution Authority of Burundi
- ❖ Electricity access in Burundi remains extremely low, at 10% nationally and less than 2% in rural areas at end-2018. – UN
- ❖ Power tariffs are high (\$ 22.4c/kWh [commercial tariffs] and \$ 16.3c/kWh [industrial tariffs] at end-2018)
- ❖ The World Bank has also financed the Resumo Falls project, of which 27 MW has been allocated to Burundi and the Jiji and Mulembwe run of river projects (49.5 MW combined)

Projects Status

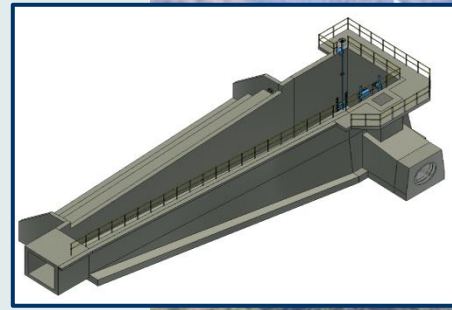
- ❖ Technical Feasibility Studies – 2020
- ❖ Land demarcated + approved by MoE – 2021
- ❖ Bankable Feasibility Studies – Ongoing...
- ❖ PPA and PPP contracts initialled (soon to be presented to cabinet for approval and Decree)
- ❖ In-country ESIA's approved
- ❖ Financial Close target date end of Q3 2024.
(Construction - Sept. 2024 + 30 months -> COD Q4 2026)
- ❖ Tembo's recent partnering with IFC



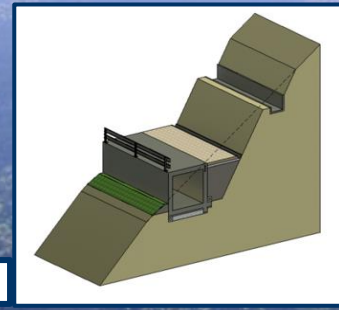
Dama Technical Challenges

- ❖ Designs must consider – steep terrain, high rainfall, seismic activity, landslides
- ❖ Aim to position pertinent infrastructure on workable platforms / points of access.
- ❖ Houses / Land is expensive (~ USD 20 - 30 k / house; USD 60 - 90 / palm tree etc.) – high productivity of cash crops such as palm oil, coffee etc.

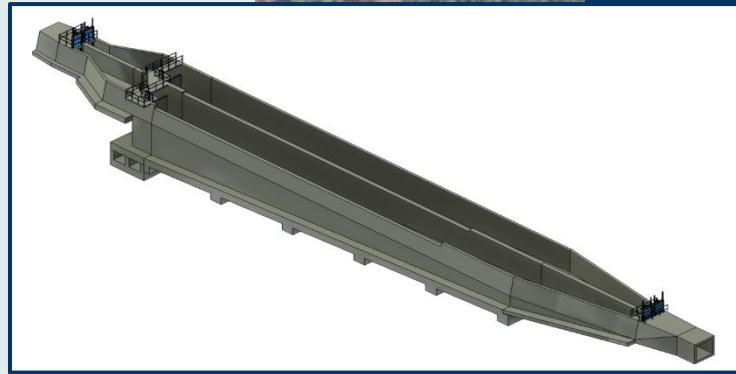
Dama Land Budget – USD 750 k (lots of palm trees)



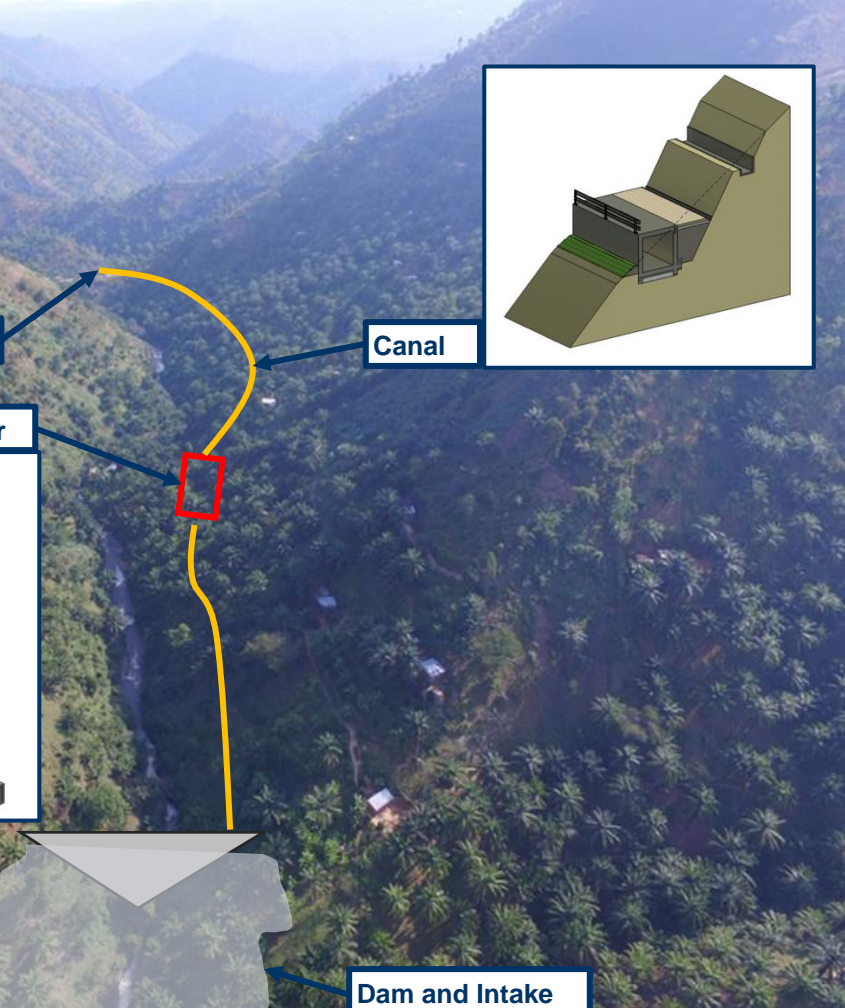
Forebay



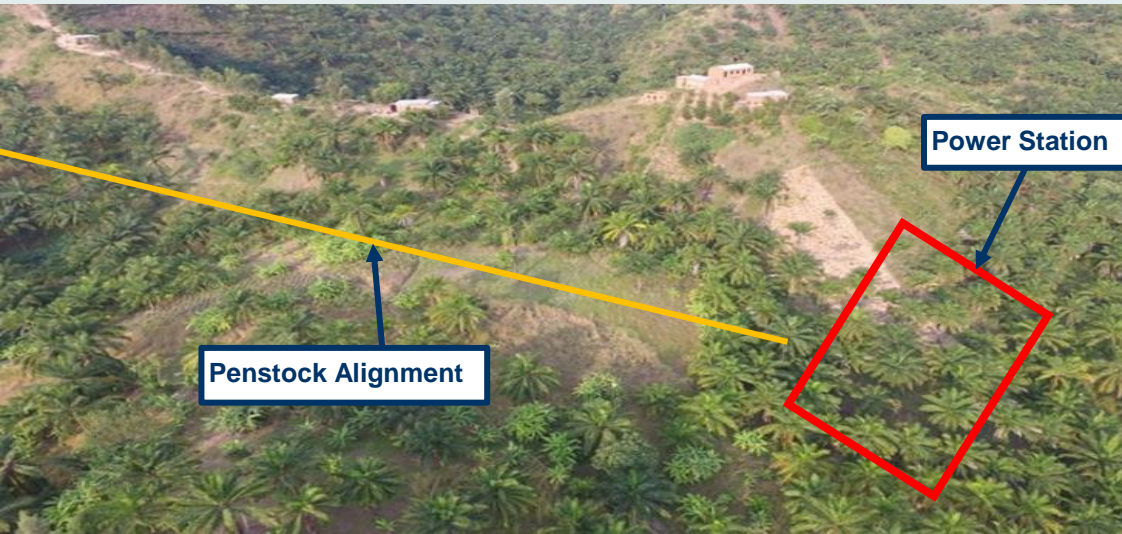
Canal



Desander

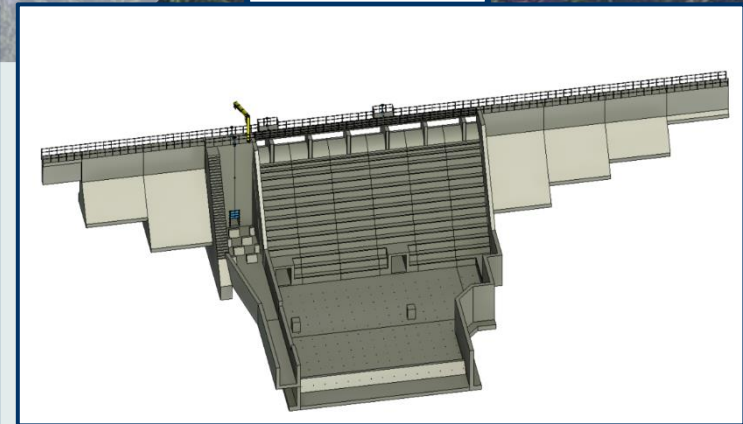


Dam and Intake



Penstock Alignment

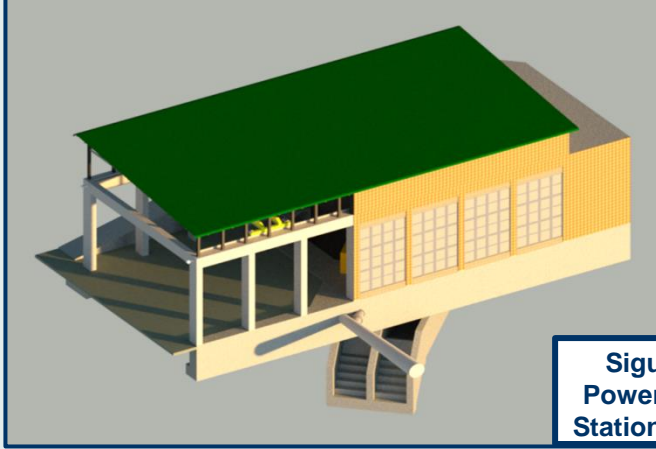
Power Station



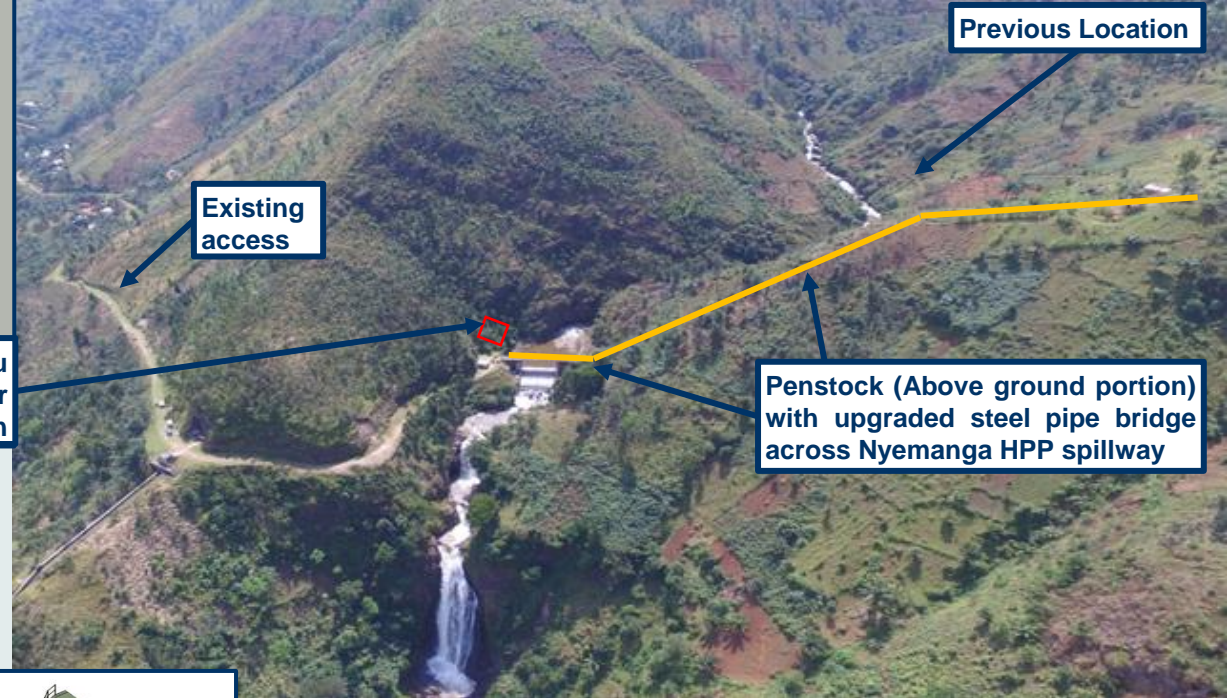
Sigu Technical Challenges

- ❖ Reducing footprint (particularly in the forest)
- ❖ Avoid cutting new roads on steep slopes - Making use of existing access / upgrading degraded roads to pertinent infrastructure.
- ❖ Above ground portion of penstock (towards end) to avoid hard rock excavation
- ❖ Again - Houses / Land is expensive...

Sigu Land Budget USD 225 k



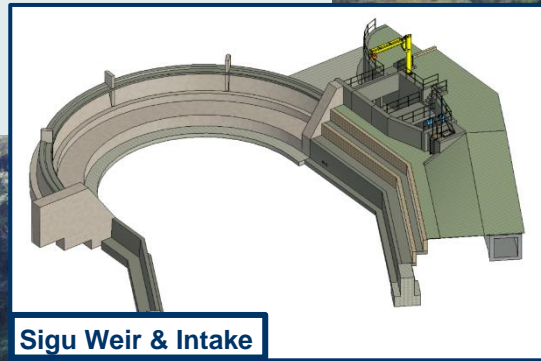
Sigu Power Station



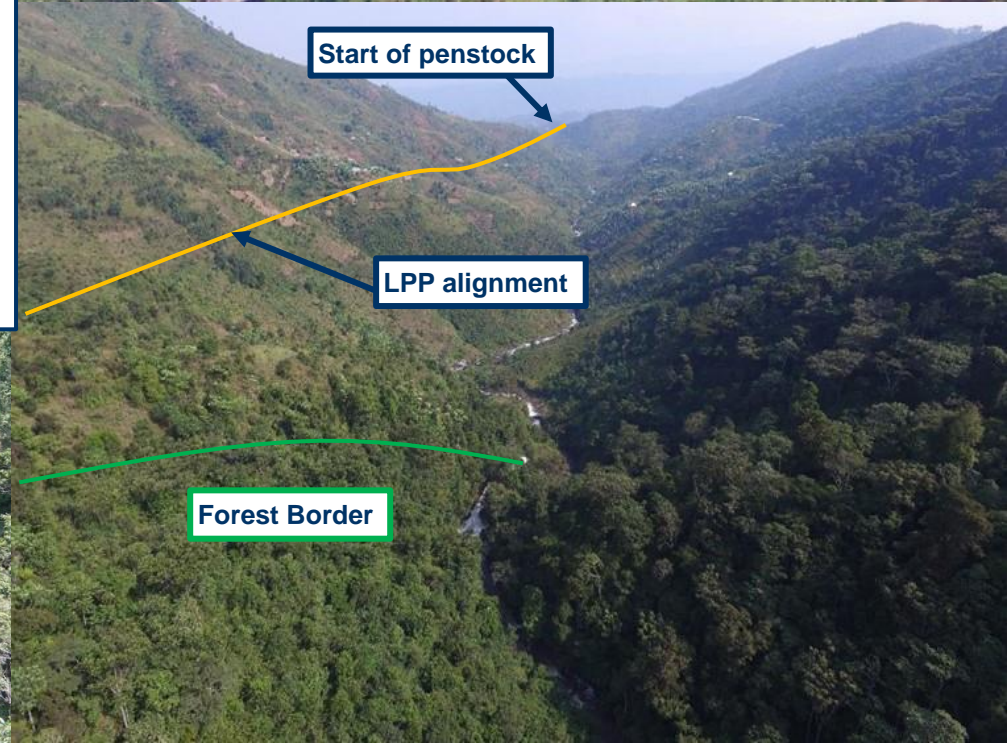
Existing access

Previous Location

Penstock (Above ground portion) with upgraded steel pipe bridge across Nyemanga HPP spillway



Sigu Weir & Intake



Start of penstock

LPP alignment

Forest Border



Project Development Challenges



Mitigating Social Costs

Reality of these projects are:

- Local communities bear construction-phase social costs, but
- Main electricity benefits added to the national grid

Mitigating Social Costs through community initiatives for Project Affected Communities (PAPs), viz.:

- Stand-alone solar-powered streetlights
- Village water supply projects



Resolving disparities between funding organizations and in-country requirements

- Collaborative effort with IFC / Innovative Approach
- Detailed review (Gap Analysis) by Tembo Power of existing ESIA's and ESMP's
 - Identifying gaps between IFC Performance Standards and in-country requirements
 - IFC review and acceptance of Gap Analysis
- Tembo Power filling gaps only – not redoing all studies
- Tembo Power compiling final environmental and social impact mitigation action plans



Presence of chimpanzees

- Funders' concerns addressed through collaboration with IFC
- IFC-commissioned study (still in progress) to confirm chimpanzee presence through grant funding
- Key Focus Areas:
 - Estimate of chimpanzee communities and overall population in reserve
 - Chimpanzee presence in project area outside the reserve
 - Frequency and purposes of chimpanzee use of project areas
 - Siguvyaye river chimpanzee crossings, timing, and crossing points
 - Project infrastructure impact on chimpanzee movement



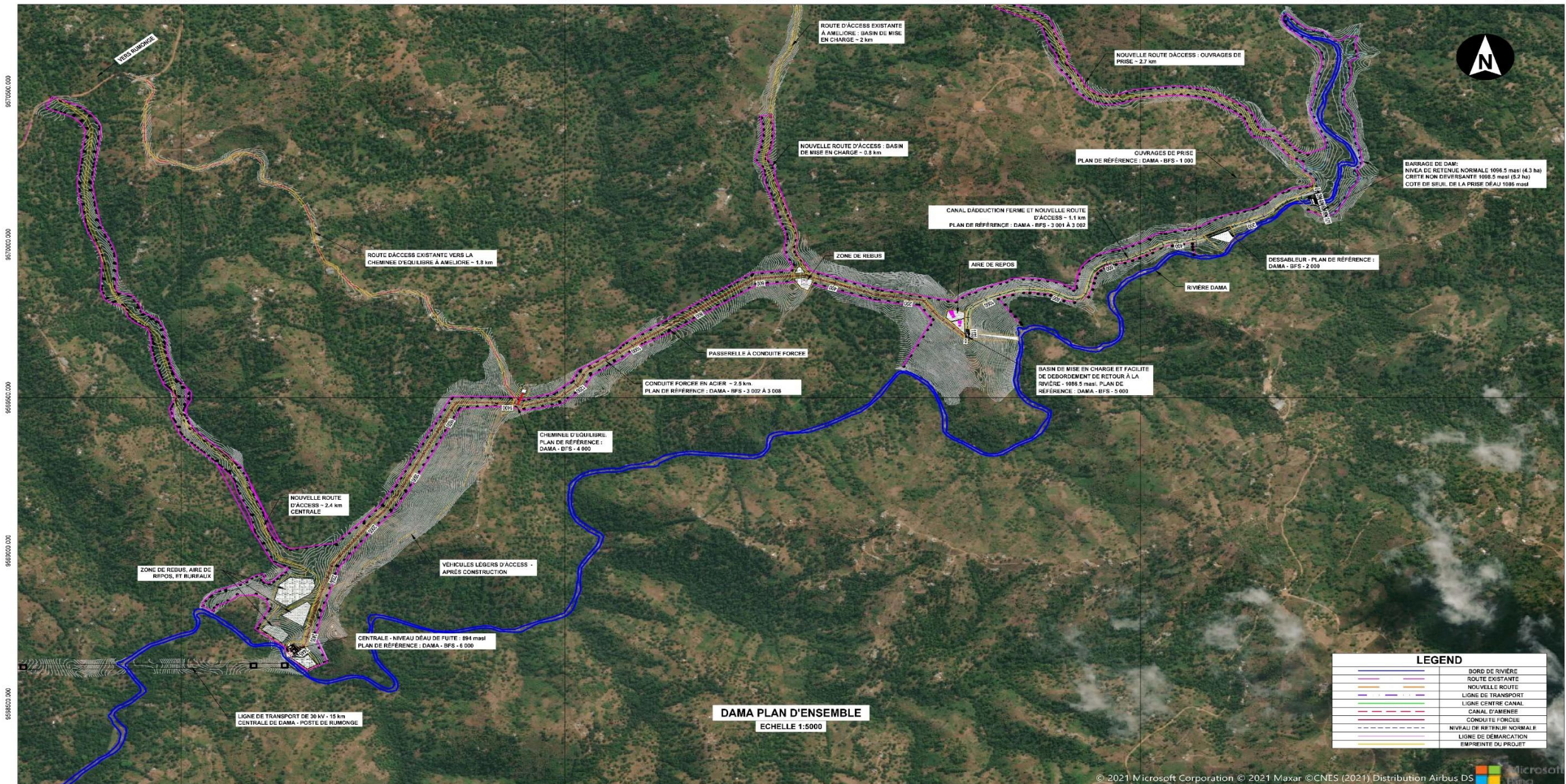
Leveraging In-Country Experiences





Thank you

Supplemental Slides (Q&A)



DAMA PLAN D'ENSEMBLE
ECHELLE 1:5000

LEGEND	
	BORD DE RIVIERE
	ROUTE EXISTANTE
	NOUVELLE ROUTE
	LIGNE DE TRANSPORT
	LIGNE CENTRE CANAL
	CANAL D'AMENEE
	CONDUITE FORCEE
	NIVEAU DE RETENUE NORMALE
	LIGNE DE DEMARICATION
	EMPREINTE DU PROJET

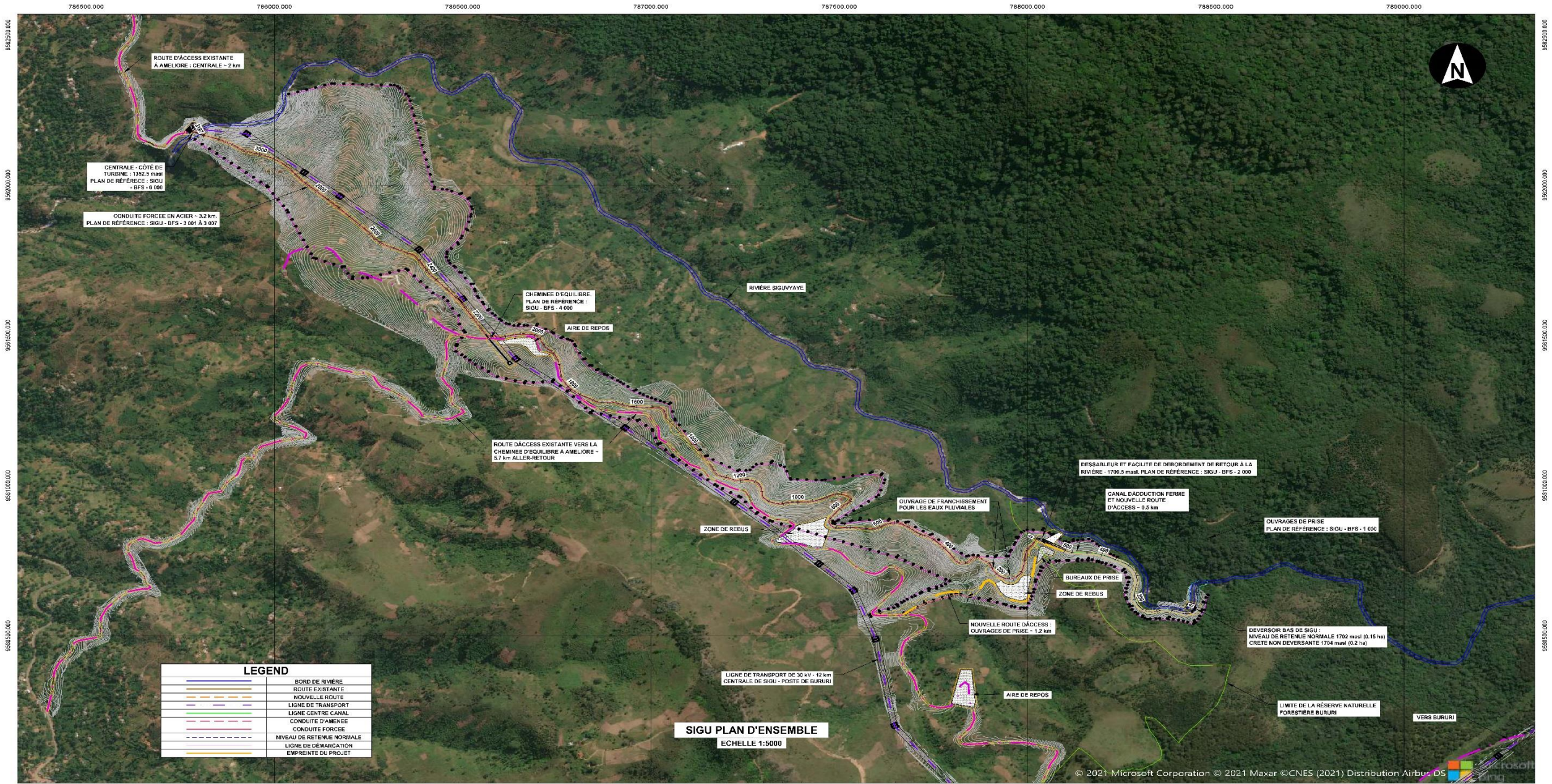
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TITRE	PLAN D'ENSEMBLE			
PLAN No.	PROJET	ÉTUDE	NUMERO	REV
	DAMA	BFS	0 000	A

DÉVELOPPEUR

REV	DATE	DETAILS DE REVISION
A	15-10-21	POUR INFORMATION

APPROUVE	B.R. COLLET
ECHELLE	COMME INDIQUE
FORMAT	A1
PREPARE	R. THOMSON
CONÇU	
VERIFIE	

NOTES



SIGU PLAN D'ENSEMBLE
ECHELLE 1:5000

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PROJET	PROJET HYDROELECTRIQUE DE SIGUVYAYE			
TITRE	PLAN D'ENSEMBLE			
PLAN No.	PROJET	ETUDE	NUMERO	REV.
	SIGU	BFS	0 000	A

DEVELOPPEUR

REV	DATE	DETAILS DE REVISION
A	15-10-21	POUR INFORMATION

APPROUVE	B.R. COLLET
ECHELLE	COMME INDIQUE
FORMAT	A1
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